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[1938] The generation of an electronic telephone card by the service director processor is performed as follows.

*[1939] First, the service director processor refers to the electronic telephone card template list 5105 for the telephone card issuer that is stored in the telephone card issuer information server. Then, by using the electronic telephone card template program that is identified by the template code 10206 of the electronic telephone card issuing commission 6303, the service director processor generates a telephone card program for an electronic telephone card. Specifically, the telephone card program data 2113 for an electronic telephone card are generated using the transaction module and the representation module, which are described as being located at the transaction module address 5119, and the representation module address 5120 in the electronic telephone card template list 5105, and the representative component information 10209 in the electronic telephone card issuing commission 6303. When the representative component information 10209 is not present in the electronic telephone card issuing commission 6303, the default representative component information located at the default representative component information address 5121 is employed as the information for an electronic telephone card.

[1940] Following this and based on the telephone card information included in the card information 10217, the service director processor generates the card status 2107 and the total remaining value 2108. Whether the card status 2107 can be transferred is designated, and the face value of the telephone card that is issued is set as the total remaining value 2107. The service director processor generates a new pair consisting of a card signature private key and a card signature public key, and further generates the telephone card program 2101 for an electronic telephone card by employing the card private key and the accounting machine public key that are registered in the electronic telephone card management information 5500.

[1941] Furthermore, the service director processor generates an electronic telephone card by employing the obtained card signature public key to generate the certificate 2103 for the electronic telephone card, and by employing the telephone card data 10219 in the electronic telephone card issuing commission 6303 to generate the presentation card 2102 for the electronic telephone card.

[1942] The procedures for the delayed clearing will now be described.

[1943] In Fig. 64 are shown the procedures for exchanging messages between the devices in the telephone card purchase process for the delayed clearing. The same process is performed as is used for the spontaneous clearing until the telephone card issuing system transmits the electronic telephone card issuing commission to the service providing system.

[1944] When the delayed clearing is designated by the clearing option 10203, the service director processor generates an electronic telephone card to be issued to the user, and also generates the electronic telephone card issuing message 10227, which includes the generated electronic telephone card, and a temporary receipt message 10310, which corresponds to a temporary receipt. The generation of the electronic telephone card is performed in the same manner as that used for the spontaneous clearing.

[1945] The user processor closes the electronic telephone card issuing message 10227 and the temporary receipt 9810 and addresses them to the user, and transmits these messages as an electronic telephone card issuing message 6404 and a temporary receipt 6405 to the mobile user terminal 100 via digital wireless telephone communication.

[1946] As is shown in Fig. 103A, the digital signature of a service provider is provided for data that consists of a temporary receipt header 10300, which is header information indicating that the message is the temporary receipt 6405 and describing the data structure; a user ID 10301; telephone card issuing information 10302; a payment service code 10303; a payment value 10304; a payment option code 10305; a request number 10306; a transaction number 10307; a service provider ID 10308; and an issued time 10309, which indicates the date on which the temporary receipt 6405 was issued. These data are closed and addressed to the user, thereby providing the temporary receipt 6405. The telephone card issuing information 10302 is information concerning the electronic telephone card issuing process that is performed by the service providing system, and is accompanied by the digital signature of the service provider.

[1947] The data structure of the electronic telephone card issuing message 6404 is the same as that used for the electronic telephone card issuing message 6308.

[1948] Upon receiving the electronic telephone card issuing message 6404 and the temporary receipt 6405, the mobile user terminal decrypts them and examines the digital signatures, enters an electronic telephone card included in the electronic telephone card issuing message 6404 in the telephone card list 1714, enters the temporary receipt 10310 in the use list 1715, and displays the electronic payment card on the LCD 303.

[1949] Following this, the service director processor performs the clearing process for the price of the telephone card. First, the service director processor generates a clearing request 10324, which is a message requesting the performance of the clearing process for the price of the telephone card. The transaction processor closes the clearing request 10324 and addresses it to the transaction processor, and transmits it as a clearing request 6407 to the transaction processing system 106.

[1950] Upon receiving the clearing request 6407, the transaction processing system 106 decrypts it and examines the digital signature, and performs the clearing process. The transaction processing system 106 generates a clearing completion notification 6408 and transmits it to the service providing system 110.

[1951] Upon receiving the clearing completion notification 6408, the transaction processor of the service providing system 110 decrypts it and examines the digital signature, and transmits a clearing completion notification 10413 to the service director processor. The service director processor employs the received clearing completion notification 10413 to generate a clearing completion notification 10430 for the telephone card issuer. And the telephone card issuer processor closes the clearing completion notification 10430 and transmits it to the telephone card issuing system 109 as a clearing completion notification 6409 for the telephone card issuer.

[1952] The telephone card issuing system decrypts the received clearing completion notification 6409 and examines the digital signature, and generates a receipt 6410 and transmits it to the service providing system.

[1953] The telephone card issuer processor of the service providing system decrypts the received receipt 6410 and examines the digital signature, and transmits a receipt 10512 to the service director processor. The service director processor employs the receipt 10512 to generate a receipt 10523 for a user.

[1954] The receipt 10523 that is generated is not immediately transmitted to the mobile user terminal 100 of the user. When the mobile user terminal has performed the data updating process, the user processor replaces the temporary receipt 10310 in the use list 1715 with the receipt 10523, and transmits the receipt 10523 as one part of the update data 6411 to the mobile user terminal 100.

[1955] The data structures of the clearing request 6407, the clearing completion notification 6408, the clearing completion notification 6409 and the receipt 6410 for the delayed clearing are the same as those provided for the clearing request 6304, the clearing completion notification 6305, the clearing completion notification 6306 and the receipt 6307 for the spontaneous clearing.

[1956] The delayed clearing process need not be performed immediately after the electronic telephone card is issued, and together with the other clearing processes, may be performed, for example, once a day.

[1957] An explanation will now be given for the contents of messages that are exchanged by the mobile user terminal 100 and the service providing system 110 during the telephone card registration processing.

[1958] In Fig. 65C are shown the procedures for exchanging messages between devices in the telephone card registration processing, and in Figs. 108A and 108B are shown the contents of messages that are exchanged by the devices in the telephone card registration processing.

[1959] First, when the user performs an electronic telephone card registration operation 6508, the mobile user terminal generates a telephone card registration request 6509 and transmits it to the service providing system via digital wireless telephone communication.

[1960] As is shown in Fig. 108A, the digital signature of a user is provided for data that consists of a telephone card registration request header 10800, which is header information indicating that the message is the telephone card registration request 6509 and describing the data structure; a card ID 10801 of a telephone card to be registered; a user ID 10802; and an issued time 10803, which indicates the date on

which the telephone card registration request 6509 was issued. These data are closed and addressed to the service provider, thereby providing the telephone card registration request 6509.

[1961] The user processor of the service providing system decrypts the received telephone card registration request 6509 and examines the digital signature, and transmits the request 6509 to the service manager processor. The service manager processor generates a service director processor to form a process group that processes a telephone card registration request 10804. The service director processor ascertains that the electronic telephone card indicated by the card ID 10801 is registered in the telephone card list 4612 for the user in the user information server 902, and registers that electronic telephone card in the registered card list 5502 for electronic telephone cards of the service director information server 901. At this time, the service director processor newly generates a card signature private key and a card signature public key pair. Further, the service director processor generates a registered card certificate using the card signature public key, and registers it in the registered card list 5502. The service director processor then generates a card certificate issuing message 10813 using the card signature private key and the registered card certificate that has been generated. The user processor closes the card certificate issuing message 10813 and addresses it to the user, and transmits it as a telephone card certificate issuing message 6510 to the mobile user terminal via digital wireless telephone communication.

[1962] As is shown in Fig. 108B, the digital signature of a service provider is provided for data that consists of a telephone card certificate issuing header 10808, which is header information indicating that the message is the telephone card certificate issuing message 6510 and describing the data structure; a card digital signature private key 10809; a registered card certificate 10810; a service provider ID 10811, and an issued time 10812, which indicates the date on which the telephone card certificate issuing message 6510 was issued. These data are closed and addressed to the user, thereby providing the telephone card certificate issuing message 6510.

[1963] The mobile user terminal 100 decrypts the received card certificate issuing message 6510 and examines the digital signature, replaces the card signature private key and the card certificate of an electronic telephone card with the card signature private key 10809 and the registered card certificate 10810, both of which are included in the telephone card certificate issuing message 6510, changes the registration state in the card status to the post-registration state, and displays on the LCD the electronic telephone card that has been registered (display a telephone card that is registered; 6511).

[1964] An explanation will now be given for the contents of messages that are exchanged by the service providing system 110 and the electronic telephone card accounting machine 800 (switching center 105) during the telephone card setup processing.

[1965] The telephone card setup processing is not performed in accordance with a special processing sequence, but is performed in the data updating process during which the service providing system updates the data in the electronic telephone card accounting machine 800.

[1966] Therefore, for the telephone card setup process, the procedures for the exchange of messages by the service providing system and the electronic telephone card accounting machine 800, and the contents (data structures) of the messages to be exchanged are the same as those used for the above described data updating processing.

[1967] It should be noted, however, that the telephone card setup process is not performed each time the data updating process is performed, but when the telephone card list 4610 for the merchant stored in the merchant information server 903 is updated by the service director processor.

[1968] When the telephone card list 4610 is updated, the merchant processor includes updated data in the telephone card list 4610 for the compressed update data 8828 in the update data 5705, and transmits the resultant data as update data 5705 to the electronic telephone card accounting machine 800.

[1969] Upon receiving the update data 5705, the electronic telephone accounting machine decompresses the update data 8828, and updates the data in the RAM and on the hard disk. At this time, the telephone card list 3908 in the electronic telephone card accounting machine 800 is updated, and an electronic telephone card that is handled by the electronic telephone card accounting machine 800 is updated.

[1970] An explanation will now be given for the contents of messages that are exchanged by between the mobile user terminal 100 and the electronic telephone card accounting machine 800 (switching center 105)

during the telephone card clearing processing.

[1971] In Fig. 70 are shown procedures for the exchange of messages by the mobile user terminal 100 and the electronic telephone card accounting machine 800 (switching center 105) during the telephone card clearing processing, and in Figs. 114A and 114B and Figs. 115A and 115B are shown the contents of messages that are exchanged by the mobile user terminal 100 and the electronic telephone card accounting machine 800 (switching center 105) during the telephone card clearing processing.

[1972] First, when a user displays an electronic telephone card used for communication and performs a calling operation 7000, the mobile user terminal employs a telephone card that is to be used for communication and an arbitrarily generated test pattern and produces a micro-check call request 7001, which is a message for requesting that a telephone number entered by a user be dialed by using the electronic telephone card. The mobile user terminal transmits the request 7001 to the switching center 105 via infrared communication.

[1973] As is shown in Fig. 114A, the micro-check call request 7001 consists of a micro-check call request header 11400, which is header information indicating that the message is the micro-check call request 7001 and describes the data structure; a service code 11401, which identifies the request for communication using an electronic telephone card; a request number 11402, which is an arbitrarily generated number that uniquely represents the telephone card clearing process; an telephone number 11403 that is a telephone number entered by the user; a presentation card 11404 for presenting an electronic telephone card to be used for the communication; a card certificate 11405; a current card status 11406 for an electronic telephone card to be used for the communication; a total remaining value 11407; a card ID 11408; an issued time 11409, which indicates the date on which the micro-check call request 7001 was issued; and an accounting machine test pattern 11411, which is an arbitrarily generated test pattern. The digital signature is provided, using the card signature private key of an electronic telephone card, for the card status 11406, the total remaining value 11407, the card ID 11408 and the issued time 11409. The accounting machine test pattern 11411 is encrypted using the accounting machine public key.

[1974] The presentation card 11404, the card certificate 11405, the card status 11406, the total remaining value 11407, the card ID 11408 and the issued date 11409 specify the contents of the electronic telephone card for the electronic telephone card accounting machine 800, and the accounting machine test pattern 11411 is a test pattern for authorizing the electronic telephone card accounting machine 800.

[1975] Upon receiving the micro-check call request 7001 at the switching center 105, first, the electronic telephone card accounting machine 800 refers to the telephone card list 3908 and activates a telephone card clearing module that corresponds to the card code (included in a presentation card) for the electronic telephone card that is presented. Then, the electronic telephone card accounting machine 800 examines the validity of the contents of the micro-check call request 7001, generates a micro-check call response 7002, which charges a communication fee V ($V < 0$) for a predetermined communication T ($T > 0$), and transmits it to the mobile user terminal via digital wireless telephone communication. When the electronic telephone card that is presented is not registered in the telephone card list 3908, the micro-check call response 3908 is transmitted, which indicates that the pertinent electronic telephone card is not available.

[1976] In the verification processing for determining the validity of the micro-check call request 7001, first, the electronic telephone card accounting machine 800 employs the fact that the card certificate 11405 is a registered card certificate, and examines the card status 11406 and the total remaining value 11407 to determine whether the electronic telephone card is valid and can be used as a telephone card for the payment of the communication charge. Then, the electronic telephone card accounting machine 800 examines the presentation card 11404, the digital signature of the service provider that is provided for the card certificate 11405, and the validity term. Further, the merchant terminal employs the card signature public key of the card certificate 11405 to examine the digital signature of the electronic telephone card that is provided for the card status 11406, the total remaining value 11407, the card ID 11408 and the issued time 11409. In this fashion, the validity of the micro-check call request 7001 is verified.

[1977] In the generation of the micro-check call response 7002, the electronic telephone card accounting machine 800 decrypts the accounting machine test pattern 11411 using the accounting machine private key, and employs the card public key to encrypt the card test pattern 11411 that is arbitrarily generated.

[1978] As is shown in Fig. 114B, the digital signature of a communication service provider is provided for the data that consists of a micro-check call response header 11413, which is header information indicating

that the message is the micro-check call response 7002 and describing the data structure; a transaction number 11414; a response message 11415; a request number 11416; a card ID 11417; an instruction code 11418; an amount of charge 11419, which indicates the communication fee V for the communication time T; an accounting machine test pattern 11420, which is decrypted; a card test pattern 11421, which is an arbitrarily generated test pattern; an accounting machine ID 11423; a communication service provider ID 11424; and an issued time 11425, which indicates the date on which the micro-check call response 7002 was issued. In this fashion, the micro-check call response 7002 is provided. The card test pattern 11421 is encrypted using the card public key.

[1979] The transaction number 11414 is a number that is arbitrarily generated, by the electronic telephone card accounting machine 800, and that uniquely represents the telephone card clearing process. When, as a result of the examination of the micro-check call request 7001, the telephone card clearing process can not be performed (when an electronic telephone card is one that can not be handled by the pertinent electronic telephone card accounting machine 800), a value of 0 is set. When the telephone card clearing process can be performed, a value other than 0 is set.

[1980] The response message 11415 is text information constituting the message transmitted by the communication service provider to the user. When the electronic telephone card accounting machine 800 can not handle an electronic telephone card that has been presented (transaction number = 0), data to that effect is included in the response message. The response message is prepared optionally, and may not be prepared.

[1981] The instruction code 11418 is command code information for an electronic telephone card, and is used when a value equivalent to the amount of charge 11419 is subtracted from the total remaining value held by the electronic telephone card. The instruction code is varied by combining the electronic telephone card transaction module and the telephone card clearing module.

[1982] When the mobile user terminal receives the micro-check call response 7002, first, for verification of to verify the electronic telephone card accounting machine 800, it compares the accounting machine test pattern 11411 with the accounting machine test pattern 11420 included in the micro-check call response 7002 in order to verify the electronic telephone card accounting machine 800. The mobile user terminal subtracts the amount of sales 11419 from the total remaining value held by the electronic telephone card in accordance with the instruction code 11418. Then, the mobile user terminal decrypts the card test pattern using the card private key, and generates a telephone micro-check message 7003, which corresponds to a check that has as its face value the amount of the charge. The check is transmitted via digital wireless telephone communication to the electronic telephone card accounting machine 800 (switching center 105). Further, the mobile user terminal displays, on the LCD, a message indicating a call is on process (display a call on process; 6704)

[1983] As is shown in Fig. 115A, the digital signature using the card signature private key and the digital signature of a user are provided for the data that consists of a telephone micro-check header 11500, which is header information indicating that the message is the telephone micro-check 7003 and describing the data structure; a micro-check issuing number 11501, which indicates the order of the telephone card clearing process; a card test pattern 11502, which is decrypted; an amount of payment 11503, which indicates the obtained value that is subtracted from the total remaining value; a card status 11504; a total remaining value 11505 available after the subtraction; an accounting machine ID 11506; a communication service provider ID 11507; a request number 11508; a transaction number 11509; a card code 11510; a card ID 11511; and an issued time 11512, which indicates the date on which the telephone micro-check 7003 was issued. In this fashion, the telephone micro-check 7003 is provided.

[1984] Upon receiving the telephone micro-check 7003 at the switching center 105, first, the electronic telephone card accounting machine 800 authorizes the electronic telephone card by comparing the card test pattern 11421 with the card test pattern 11502 that is included in the telephone micro-check 7003, and examines the validity of the contents of the telephone micro-check 7003. In the verification process for the validity of the telephone micro-check 7003, the electronic telephone accounting machine 800 determines whether the amount of payment 11503 represented by the telephone micro-check 7003 is equal to the value of the charge. Also, the electronic telephone card accounting machine 800 determines whether the value obtained by subtracting the total remaining value 11505 from the total remaining value 11407, which represents the micro-check call request, is equal to the amount of payment 11503 represented by the telephone micro-check. Finally, the electronic telephone card accounting machine 800 examines the digital signature of the electronic telephone card accompanying the telephone micro-check 7003.

[1985] The switch 801 transmits, to the telephone terminal 115, a call arrival request 7005, which is a message for calling the telephone terminal 115 that corresponds to the telephone number 11403. Upon receiving the call arrival request 7005, the telephone terminal 115 outputs a call tone to notify the owner (call receiver) of the telephone terminal 115 that a call has arrived (display the arrival of a call; 7006). When the recipient raises the handset (communication operation 7007), the telephone terminal 115 transmits, to the switch 801, a call response 7008, which is a message to permit the call.

[1986] When the switch 801 receives the call response 7008, the electronic telephone card accounting machine 800 generates a receipt message 7009 that corresponds to a receipt for the telephone micro-check 7003 that is paid, and transmits the message to the mobile user terminal via digital wireless telephone communication. The switch 801 connects the lines of the mobile user terminal 100 and the telephone terminal 115, so that the user can communicate with the call recipient.

[1987] As is shown in Fig. 115B, the digital signature of a merchant is provided for the data that consists of a receipt header 11514, which is header information indicating that the message is the receipt 7009 and describing the data structure; provided service information 11515; a card ID 11516; a total receipt value 11517, which reflects the same value as the amount of payment 11503 remitted by the telephone micro-check that is received; a request number 11518; a transaction number 11519; a telephone micro-check issuing number 11520; an accounting machine ID 11521; a communication service provider ID 11522; and an issued time 11523, which indicates the date on which the receipt 7009 was issued. In this fashion, the receipt 7009 is provided.

[1988] The provided service information 11515 is text information that represents the contents of the communication service provided through the telephone card clearing process, and corresponds to the specifications or the statement of accounts for the services that are provided.

[1989] Upon receiving the receipt 7009, the mobile user terminal verifies that the total receipt value 11517 is equal to the amount of payment 11503 remitted using the telephone micro-check, registers the receipt 7009 as usage information in the usage list 1715, and changes the display on the LCD to a display indicating the connection state (the telephone number used for communication, the elapsed communication time and the total remaining value of an electronic telephone card) (display the connection state; 7010).

[1990] When the mobile user terminal 100 does not receive the receipt 7009 after it has transmitted the telephone micro-check 7003, for example, when the user presses the end switch 306 while the ringing is in progress and cancels the call before the receipt 7009 is received, the mobile user terminal 100 adds the amount of sales 11419 to the total remaining value of the electronic telephone card, and returns the value to what it was before the subtraction was performed.

[1991] When the communication time exceeds T , instead of the telephone micro-check 7003 having the face value V , the electronic telephone accounting machine transmits a communication charge message 7011, which is a charge requiring the submission of a telephone micro-check having a face value that equals a communication fee $2V$ charged for a communication time $2T$, to the mobile user terminal via digital wireless telephone communication.

[1992] As is shown in Fig. 115C, the digital signature of a communication service provider is provided for the data that consists of a communication charge response header 11524, which is header information indicating that the message is the communication charge 7011 and describing the data structure; a transaction number 11515; a request number 11526; a card ID 11527; an instruction code 11528; an amount of charge 11529, which accesses an additional charge value V ; an accounting machine ID 11530; a communication service provider ID 11531; and an issued time 11532, which indicates the date on which the communication charge 7011 was issued. In this fashion, the communication charge 7011 is provided. The transaction number 11525 is the same as the transaction number 11414 provided for the micro-check call response 7002, the transaction number 11509 for the telephone micro-check 7003, and the transaction number 11519 for the receipt 7009.

[1993] Upon receiving the communication charge 7011, the mobile user terminal subtracts the amount of charge 11529 (the additional charge value V) from the total remaining value of the electronic telephone card. Instead of the telephone micro-check 7003, the mobile user terminal generates a telephone micro-check 7012, which has a face value of $2V$ that corresponds to the total value subtracted from the total remaining value, and transmits it to the electronic telephone accounting machine 800 (switching center 105).

via digital wireless telephone communication.

[1994] As is shown in Fig. 115A, the data structure of the telephone micro-check 7012 is the same as that of the telephone micro-check 7003. The amount of payment 11503 remitted by the telephone micro-check 7012 is 2V, which corresponds to the total value subtracted from the total remaining value, and the total remaining value 11505 is the total remaining value after the amount of charge 11529 has been subtracted.

[1995] The same numbers as are used for the telephone micro-check 7003 are also employed as the micro-check issuing number 11501, the request number 11508 and the transaction number 11509 in the telephone micro-check 7012, which identify the telephone micro-check that is issued as the replacement for the telephone micro-check 7003.

[1996] Upon receiving the telephone micro-check 7012, the electronic telephone card accounting machine verifies the validity of the telephone micro-check 7012, and generates a receipt message 7013 that corresponds to a receipt for the telephone micro-check 7012 that has been issued and transmits it to the mobile user terminal via the digital wireless telephone terminal.

[1997] During the process of examining the validity of the telephone micro-check 7012, first, the electronic telephone card accounting machine 800 ascertains that the amount of payment 11503 reflected by the telephone micro-check 7012 is equal to the total amount charged, and ascertains that the result obtained by subtracting the total remaining value 11505, indicated by the telephone micro-check 7012, from the amount of stored value 11407, indicated by the macro check call request, is equal to the total amount of payment 11503 reflected by the telephone micro-check. Then, the accounting machine 800 examines the digital signature that is provided for the telephone micro-check 7012 using the electronic telephone card.

[1998] As is shown in Fig. 115A, the data structure of the receipt 7013 is the same as that used for the receipt 7009. The total receipt value 11517 of the receipt 7013 is equal to the amount of payment 11503 reflected by the telephone micro-check 7012.

[1999] Upon receiving the receipt 7013, the mobile user terminal verifies that the total receipt value 11517 is equal to the amount of payment 11503 reflected by the telephone micro-check 7012, registers the receipt 7013, instead of the receipt 7009, as usage information in the usage list 1715, and updates the total remaining amount of the electronic telephone card that is displayed on the LCD (display the accounts; 7014).

[2000] When the mobile user terminal 100 does not receive the receipt 7013 after it has transmitted the telephone micro-check 7012, such as when, for example, the communication is terminated before the receipt 7013 is received, the mobile user terminal 100 adds the amount of charge 11529 to the total remaining value of the electronic telephone card, and returns the value to what it was before the amount of charge 11529 was subtracted.

[2001] Each time the communication time exceeds NT (T is a natural number), instead of the telephone micro-check having the face value NV, the electronic telephone accounting machine 800 transmits a communication charge message 7015, which includes a charge for a telephone micro-check having as a face value a communication fee (N+1)V that is assessed for a communication time (N+1)T, to the mobile user terminal via digital wireless telephone communication. As is shown in Fig. 115C, the data structure of the communication charge 7015 is the same as that used for the communication charge 7011.

[2002] The mobile user terminal further subtracts the amount of charge 11529 (additional communication charge value V) from the total remaining value of the electronic telephone card, generates a telephone micro-check 7016 having a face value of (N+1)V, which corresponds to the total value subtracted from the total remaining value, and transmits it to the electronic telephone card accounting machine 800 (switching center 105) via digital wireless telephone communication.

[2003] As is shown in Fig. 115A, the data structure of the telephone micro-check 7016 is the same as that used for the telephone micro-check 7003 or 7012. The amount of payment 11503 reflected by the telephone micro-check 7016 is (N+1)V, which corresponds to the total value subtracted from the total remaining value, and the total remaining value 11505 is that which is available after the amount of charge 11529 has been subtracted.

[2004] Upon receiving the telephone micro-check 7016, the electronic telephone card accounting machine

800 examines the validity of the telephone micro-check 7016, and generates a receipt message 7017 that corresponds to a receipt for the telephone micro-check 7016 that has been paid and transmits it to the mobile user terminal via digital wireless telephone communication.

[2005] During the process of examining the validity of the telephone micro-check 7016, first, the electronic telephone card accounting machine 800 ascertains that the amount of payment 11503 reflected by the telephone micro-check 7016 is equal to the total amount of the charge, and ascertains that the result obtained by subtracting the total remaining value 11505, indicated by the telephone micro-check, from the total remaining value 11407, indicated by the macro check call request, is equal to the total amount of payment 11503 reflected by the telephone micro-check. Then, the accounting machine 800 uses the electronic telephone card to examine the digital signature that is provided for the telephone micro-check 7016.

[2006] As is shown in Fig. 115B, the data structure of the receipt 7017 is the same as that used for the receipt 7013. The total receipt value 11517 of the receipt 7017 is equal to the amount of payment 11503 of the telephone micro-check 7016.

[2007] Upon receiving the receipt 7017, the mobile user terminal verifies that the total receipt value 11517 is equal to the amount of payment 11503 reflected by the telephone micro-check 7016, registers the receipt 7017, instead of the receipt having type same request number (the previously registered receipt), as usage information in the usage list 1715, and updates the total remaining amount of the electronic telephone card that is displayed on the LCD (display the accounts; 7018).

[2008] When the mobile user terminal 100 does not receive the receipt 7017 after it has transmitted the telephone micro-check 7016, such as when, for example, the communication is terminated before the receipt 7017 is received, the mobile user terminal 100 adds the amount of charge 11529 transmitted in the communication charge message 7015 to the total remaining value of the electronic telephone card, and returns the value to what it was before the amount of charge 11529 was subtracted.

[2009] When a communication session using the electronic telephone card is terminated, the mobile user terminal 100 increments the micro-check issue number of the electronic telephone card.

[2010] At the termination of a communication session, the electronic telephone card accounting machine 800 registers, in the transaction list 3909, the receipt that has been transmitted to the mobile user terminal and the corresponding telephone micro-check as history information for the telephone card clearing process.

[2011] The contents of the call arrival request 7005 and the call response 7008, which are messages exchanged by the switching center 105 and the telephone terminal 115, depend on the protocol for the line connection established between the switching center 105 and the telephone terminal 115.

[2012] An explanation will now be given for the contents of messages that are exchanged by the devices during the telephone card reference processing.

[2013] In Fig. 73 are shown procedures for the exchange of messages by the devices during the telephone card reference processing, and in Figs. 88A to 88D and Fig. 116B are shown the contents of messages that are exchanged during the telephone card reference processing.

[2014] The telephone card reference processing is not performed in accordance with a special processing sequence, but is performed in the data updating process during which the service providing system updates the data in the electronic telephone card accounting machine 800.

[2015] Therefore, for the telephone card reference process, the procedures for the exchange of messages by the electronic telephone card accounting machine 800 and the service providing system, and the contents (data structures) of the messages to be exchanged are the same as those employed for the above described data updating processing.

[2016] Compressed upload data 8818 in the upload data 5704 include a telephone micro-check that is newly registered in the transaction list 3909 during the telephone card clearing process conducted during the period extending from the previous performance of the data updating process to the current performance of the data updating process.

[2017] During the data updating processing, the merchant processor transmits, to the service manager processor, a message requesting the reference process be performed for the telephone micro-check that is uploaded from the electronic telephone card accounting machine 800. The service manager processor generates a service director processor to form a process group for examining the validity of the telephone micro-check.

[2018] First, the service director processor determines whether the accounting machine ID 11505 and the communication service provider ID 11506 in the telephone micro-check match the accounting machine ID 5215 of the communication service provider and the communication service provider ID 5214. Then, the service director processor examines the registered card list 5502 in the service director information server 901 to verify that the electronic telephone card for which the telephone micro-check was issued is registered. The service director processor employs the user public key 5519 to examine the digital signature of the user that accompanies the telephone micro-check, and employs the registered card certificate to examine the digital signature for the telephone card that accompanies the telephone micro-check. In addition, the service director processor employs the telephone micro-check issuing number when examining the matching of the amount of payment with the total remaining value, and transmits the result of the examination to the merchant processor. As a result, the telephone micro-check that is ascertained to be valid is registered in the telephone micro-check list.

[2019] When an error occurs in the process for verifying the validity of the telephone micro-check, the service director processor transmits a message indicating that an error occurred in the management system 908.

[2020] Upon receiving the update data 5705, the electronic telephone card accounting machine 800 decompresses the update data 8828 and updates the data in the RAM and on the hard disk.

[2021] If the firm represented by the communication service provider differs from that represented by the telephone card issuer, and a payment for the communication service provider who handles the telephone card is made by the telephone card issuer, or if the usage of the telephone card is periodically reported to the telephone card issuer in accordance with the terms of a contract, in accordance with the telephone micro-check that is newly registered in the telephone micro-check list, the service director processor generates weekly, for example, a usage condition notification 11626, which is a message for notifying the telephone card issuer of the telephone card usage condition. The telephone card issuer processor closes the notification 11626 and addresses it to the telephone card issuer, and transmits it as a usage report 7300 to the telephone card issuing system 109.

[2022] As is shown in Fig. 116C, the digital signature of a service provider is provided for the data that consists of a usage report header 11620, which is header information indicating that the message is the usage report 7300 and describing the data structure; a card ID and payment value list 11621 of telephone cards that are employed; the communication service provider name 11622 and the communication service provider ID 11623 of a communication service provider that handles the telephone card; a service provider ID 11624; and an issued time 11625, which indicates the date on which the usage report 7300 was issued. These data are closed and addressed to the telephone card issuer, thereby providing the usage report 7300.

[2023] Upon receiving the usage report 7300, the telephone card issuing system 109 decrypts it and examines the digital signature, and performs such processing as making a payment to the merchant.

[2024] An explanation will now be given for the contents of messages that are exchanged by the devices during the telephone card transfer processing.

[2025] In Fig. 76 are shown procedures for the exchange of messages by the devices during the telephone card transfer processing, and in Figs. 120A and 120B, 121A and 121B, and 122A and 122C are shown the contents of messages that are exchanged during the telephone card transfer processing.

[2026] The telephone card transfer process can be performed when the card status 2107 of the electronic telephone card indicates the transfer enabled state, which is designated by the telephone card issuer when issuing a telephone card.

[2027] In Fig. 76 is shown a case where user A transfers an electronic telephone card to user B. The

procedures for the exchange of messages by the devices belonging to users A and B are the same for infrared communication as they are for digital wireless communication. The data structures of messages are also the same.

[2028] In Fig. 76, first, when user A performs a telephone card transfer process 7600, the mobile user terminal of user A transmits a telephone card transfer offer 7601, which is a message offering to transfer an electronic telephone card, to the mobile user terminal of user B. When at this time the mobile user terminals of user A and user B are connected, communication between user A and user B is performed via digital wireless telephone. When the mobile user terminals are not connected, infrared communication is employed.

[2029] As is shown in Fig. 120A, the digital signature of user A is provided for the data consisting of a card transfer offer header 12000, which is header information indicating that the message is the card transfer offer 7601 and describing the data structure; a transfer offer number 12001, which is an arbitrarily generated number that uniquely represents the telephone card transfer process; a presented card 12002 and a card certificate 12003 for an electronic telephone card to be transferred; a card status 12004; a total remaining value 12005; a card ID 12006; an issued time 12007, which indicates the date on which the card transfer offer 7601 was issued; and a user public key certificate 12009. In this fashion, the card transfer offer 7501 is provided. The digital signature of the electronic telephone card is provided, using the card signature private key, for the card status 12004, the variable card information 12005, the card ID 12006 and the issued time 12007.

[2030] The digital signature of the service provider is provided for the data that consist of a user public key header 12010; the user public key 12011 of user A; a public key certificate ID 12012, which is ID information for the public key certificate; a certificate validity term 12013; a service provider ID 12014; and a certificate issued time 12015. In this fashion, the user public key certificate 12009 is provided.

[2031] Upon receiving the card transfer offer 7601, the mobile user terminal of user B examines the presented card 12002, the card certified 12003, and the digital signature of the service provider and the validity term of the public key certificate 12009. Then, the mobile user terminal examines the digital signature of the electronic telephone card that is provided for the card status 12004, the total remaining value 12005, the card ID 12006 and the issued time 12007, and the digital signature of user A accompanying the card transfer offer 7601, and verifies the contents of the card transfer offer 7501. In accordance with the presented card 12002, the card status 12004 and the total remaining value 12005, the mobile user terminal then displays, on the LCD, the contents of the electronic telephone card that is to be transferred (display the transfer offer; 7602).

[2032] When user B performs a transfer offer acceptance operation 7603, the mobile user terminal of user B transmits, to the mobile user terminal of user A, a card transfer offer response 7604, which is a response message for the card transfer offer 7601.

[2033] As is shown in Fig. 120B, the digital signature of user B is provided for the data that consist of a card transfer offer response header 12016, which is header information indicating that the message is the card transfer offer response 7604 and describing the data structure; an acceptance number 12017; a transfer offer number 12018; a card ID 12019; an issued time 12020, which indicates the date on which the card transfer offer response 7604 was issued; and a user public key certificate 12021. In this fashion, the card transfer offer response 7604 is provided.

[2034] The user public key certificate 12021 is a public key certificate for user B. To provide this certificate 12021, the digital signature of the service provider is provided for the data that consist of a user public key certificate header 12022; a user public key 12023 for user B; a public key certificate ID 12024, which is ID information for the public key certificate; a certificate validity term 12025; a service provider ID 12026; and a certificate issued time 12027.

[2035] The acceptance number 12017 is arbitrarily generated, by the mobile user terminal of user B, as a number that uniquely represents the telephone card transfer processing. With this number, the mobile user terminal of user A is notified as to whether user B has accepted the card transfer offer 7601. When user B does not accept the card transfer offer 7601, a value of 0 is set as the acceptance number 12017. When user B accepts the card transfer offer 7601, a value other than 0 is set.

[2036] Upon receiving the card transfer offer response 7604, the mobile user terminal of user A displays, on

the LCD, the contents of the card transfer offer response 7604 (display the transfer offer response; 7605). When the card transfer offer 7601 is accepted (acceptance number 12017 NOTEQUAL 0), the mobile user terminal of user A examines the digital signature of the service provider of the user public key certificate 12021 and the validity term. The mobile user terminal generates a card transfer certificate 7606, which is a message that corresponds to a transfer certificate for an electronic telephone card to user B, and transmits it to the mobile user terminal of user B.

[2037] As is shown in Fig. 121A, the digital signature of the electronic payment and the digital signature of user A are provided for the data that consist of a card transfer certificate header 12100, which is header information indicating that the message is the card transfer certificate 7506 and describing the data structure; a presentation card 12101 for an electronic telephone card to be transferred; a card status 12102; a total remaining value 12103; a transfer offer number 12104; an acceptance number 12105; a public key certificate ID 12106 for the user public key certificate of user B; a public key certificate ID 12107 for the user public key certificate of user A; a card ID 12108; and an issued time 12109, which indicates the date on which the card transfer certificate 7606 was issued. These data are closed and addressed to user B, thereby providing the card transfer certificate 7606.

[2038] Upon receiving the card transfer certificate 7606, the mobile user terminal of user B decrypts it and examines the digital signature of user A and the one accompanying the electronic telephone card. Further, the mobile user terminal compares the card ID presented by the card transfer offer 7601 with the card ID 12108, and compares the public key certificate IDs 12106 and 12107 with the public key certificates of users B and A to verify the contents of the card transfer certificate 7606. The mobile user terminal then generates a card transfer receipt 7607, which is a message indicating the electronic telephone card has been received, and transmits the receipt 7607 to the mobile user terminal of user A.

[2039] As is shown in Fig. 121B, the digital signature of user B is provided for the data that consist of a card transfer receipt header 12115, which is header information indicating that the message is the card transfer receipt 7607 and describing the data structure; a card ID 12116; a transfer offer number 12117; an acceptance number 12118; a public key certificate ID 12119 for the user public key certificate of user A; a public key certificate ID 12120 for the user public key certificate of user B; and an issued time 12121, which indicates the date on which the card transfer receipt 7607 was issued. These data are closed and addressed to user A, thereby providing the card transfer receipt 7607.

[2040] Upon receiving the card transfer receipt 7607, the mobile user terminal of user A decrypts it, and examines the digital signature of user B. Further, the mobile user terminal compares the public key certificate IDs 12119 and 12120 with the public key certificates of users B and A to verify the contents of the card transfer receipt 7607. The mobile user terminal then erases the transferred electronic telephone card from the card list 1714, and registers the card transfer receipt 12122 in use history 1715. At this time, addresses in the object data area at which the transfer offer number, the code information indicating the card transfer process, the issued time for the card transfer receipt 7607 and the card transfer receipt 12122 are stored are assigned to the request number 1840 in the use list 1715, the service code 1841, the use time 1842 and the use information address 1843.

[2041] The mobile user terminal of user A displays, on the LCD, a message indicating the completion of the transfer process (display the transfer process; 7608). The process at the mobile user terminal of user A (sender) is thereafter terminated.

[2042] After transmitting the card transfer receipt 7607, the mobile user terminal of user B displays the received card transfer certificate 12111 on the LCD. In addition, the mobile user terminal displays a dialogue message inquiring whether the transfer process with the service providing server (process for downloading the received electronic telephone card from the service providing system) should be immediately performed (display the transfer certificate; 7609).

[2043] The dialogue message has two operating menus: "transfer process request" and "cancel." When "cancel" is selected, the transfer process performed with the service providing server is canceled, and in the process (data updating process) during which the service providing system updates the data in the mobile user terminal, an electronic telephone card that has been transferred is assigned to the mobile user terminal.

[2044] When user B selects "transfer process request" (transfer process request operation; 7610), based on the card transfer certificate 12111 the mobile user terminal generates a card transfer request 7611,

which is a message requesting that the transfer process be performed with the service providing system, and transmits it to the service providing system via digital wireless telephone communication.

[2045] As is shown in Fig. 122A, the digital signature of user B is provided for the data that consists of a card transfer request header 12200, which is header information indicating that the message is the card transfer request 7611 and describing the data structure; a decrypted card transfer certificate 12201 (12111); the user ID 12202 of user B; and an issued time 12203, which indicates the date when the card transfer request 7611 was issued. These data are closed and addressed to the service provider, thereby providing the card transfer request 7611.

[2046] Upon receiving the card transfer request 7611, the user processor of user B of the service providing system 110 decrypts it and examines the digital signature, and transmits it to the service manager processor. The service manager processor generates a service director processor to form a process group for processing the card transfer request 12204.

[2047] The service director processor, first refers to the user list 5200 and specifies the recipient (user B) and the sender (user A) of the transfer process by employing the public key certificate IDs 12106 and 12107 in the card transfer certificate 12201 that is included in the card transfer request 12204. The service director processor examines the digital signature of the user A and the digital signature accompanying the electronic telephone card, which are provided for the card transfer certificate 12201, and verifies the validity of the card transfer certificate 12201. Following this, the service director processor erases the electronic telephone card to be transferred from the card list 4612 of the user A that is stored in the user information server 902. Then, the service director processor changes the card signature private key and card signature public key pair and the card certificate for a new key pair and a card certificate, and also changes the card status and the total remaining value to the card status 12102 and to the total remaining value 12103 for the card transfer certificate 12201. The service director processor generates an electronic telephone card received from user A, and enters it in the card list 4612 for the user B.

[2048] When the electronic telephone card that is to be transferred has already been registered, the service director processor updates the registered card list 5502 holding the electronic telephone card. Specifically, the user ID 5518, the user public key 5519, the registered card certificate address 5520, the telephone micro-check list address 5521 and the former user information address 5522, all of which are in the registered card list 5502, are updated (to the information for user B). The old information (information for user A) is pointed to at the former user information address 5522 as former user information 5523..

[2049] The service director processor generates a telephone card transfer message 12226, which includes an electronic telephone card transferred from user A. The user processor of user B closes the message 12226 and addresses it to the user B, and transmits it as a telephone card transfer message 7612 to the mobile user terminal of user B via digital wireless telephone communication.

[2050] As is shown in Fig. 122C, the digital signature of the service provider is provided for the data that consist of a telephone card transfer header 12219, which is header information indicating that the message is the card transfer 7612 and describing the data structure; a transfer number 12220, which is an arbitrarily generated number that represents the transfer process in the service providing system; transfer information 12221; an acceptance number 12222; an electronic telephone card 12223, which is transferred; a service provider ID 12224; and an issued time 12225, which indicates the date when the telephone card transfer message 7612 was issued. These data are closed and addressed to the user B, thereby providing the card transfer message 7612.

[2051] The transfer information 12221 is information concerning the electronic telephone card transfer process performed by the service providing system, and is accompanied by the digital signature of the service provider. The mobile user terminal of user B decrypts the received telephone card transfer message 7612 and examines the digital signature, registers the electronic telephone card 12223 in the card list 1714, and displays the electronic telephone card on the LCD (display the electronic telephone card; 7613). The card transfer process is thereafter terminated.

[2052] An explanation will now be given for the contents of messages that are exchanged by the devices during the electronic telephone card installation processing.

[2053] In Fig. 79 are shown procedures for the exchange of messages by the devices during the electronic telephone card installation processing, and in Figs. 127A and 127B, and 128A and 128B are shown the

contents of messages that are exchanged during the electronic payment installation processing.

[2054] First, when the user performs an electronic telephone card installation operation 7900, the mobile user terminal generates an electronic telephone card installation request 7901, and transmits it to the service providing system 110 via digital wireless telephone communication.

[2055] As is shown in Fig. 127A, the digital signature of the user is provided for the data that consists of an electronic telephone card installation request header 12700, which is header information indicating that the message is the electronic telephone card installation request 7901 and describes the data structure; an installation card number 12701 and an installation number 12702, which are entered by a user; a request number 12703, which is an arbitrarily generated number that uniquely represents the electronic telephone card installation process; a user ID 12704; and an issued time 12705, which indicates the date when the electronic telephone card installation request 7901 was issued. These data are closed and addressed to the service provider, thereby providing the electronic telephone card installation request 7901.

[2056] Upon receiving the electronic telephone card installation request 7901, the user processor of the service providing system 110 decrypts it and examines the digital signature, and transmits it to the service manager processor. The service manager processor generates a service director processor to form a process group for processing the electronic telephone card installation request 12706.

[2057] First, the service director processor refers to the installation card list that is indicated by the installation card list address 5243 for the telephone card issuer list 5205, and specifies a telephone card issuer who issues a telephone card that is represented by the installation number 12701. The service director processor generates a telephone card installation request 12717, which is a message requesting that the telephone card issuer issue a telephone card using the installation card. The telephone card issuer processor closes the request 12717 and addresses it to the telephone card issuer, and transmits it as a telephone card installation request 7902 to the telephone card issuing system 108.

[2058] As is shown in Fig. 127B, the digital signature of the service provider is provided for the data that consist of a telephone card installation request header 12710, which is header information indicating that the message is the telephone card installation request 7902 and describing the data structure; an installation card number 12711; an installation number 12712; a request number 12713; a customer number 12714, which uniquely represents a user for the telephone card issuer; a service provider ID 12715; and an issued time 12716, which indicates the date when the telephone card installation request 7902 was issued. These data are closed and addressed to the telephone card issuer, thereby providing the telephone card installation request 7902.

[2059] Upon receiving the telephone card installation request 7902, the telephone card issuing system 109 decrypts it and examines the digital signature. The telephone card issuing server 1300 compares the installation card number 12711 and the installation number 12712, which are included in the telephone card installation request 7902, with the management information for the issued electronic telephone card installation card that is stored in the telephone card issuing information server 1302. The telephone card issuing server 1300 then updates the data in the customer information server 1302 and the telephone card issuing information server 1303. Furthermore, the telephone card issuing server generates telephone card data (12806) for a requested telephone card, and transmits, to the service providing system, an electronic telephone card installation commission 7903, which is a message requesting the installation of an electronic telephone card that corresponds to the requested telephone card.

[2060] As is shown in Fig. 128A, the digital signature of the telephone card issuer is provided for the data that consists of an electronic telephone card installation commission header 12800, which is header information indicating that the message is the electronic telephone card installation commission 7903 and describing the data structure; a transaction number 12801, which is an arbitrarily generated number that uniquely represents the transaction with a user; telephone card issuing information 12802; a request number 12803; card code 12804, which indicates the type of electronic telephone card that is to be issued; a template code 12805, which indicates a template program for an electronic telephone card to be issued; telephone card data 12806; representative component information 12807; a telephone card issuer ID 12808; and an issued time 12809, which indicates the date when the electronic telephone card installation commission 7903 was issued. These data are closed and addressed to the service provider, thereby providing the electronic telephone card installation commission 7903.

[2061] The telephone card issuing information 12802 is information concerning the telephone card issuing

process performed by the telephone card issuing system, and is accompanied by the digital signature of the telephone card issuer.

[2062] The telephone card data 12806 is telephone card information issued by the telephone card issuer, wherein the digital signature of the telephone card issuer accompanies the data that consists of the card ID 12814, the telephone card information 12815 and the card ID 12816.

[2063] The telephone card issuer processor of the service providing system decrypts the received electronic telephone card installation commission 7903 and examines the digital signature, and transmits the commission 7903 to the service director processor. In accordance with the electronic telephone card installation commission 12810, the service director processor generates an electronic telephone card to be issued to a user, using the same procedures as are used for the telephone card purchase processing, and also generates an electronic telephone card installation message 12815, which is a message directing that the electronic telephone card be installed in the mobile user terminal. The user processor closes the electronic telephone card installation message 12855 and addressees it to a user, and transmits it as an electronic telephone card installation message 7904 to the mobile user terminal via digital wireless telephone communication.

[2064] As is shown in Fig. 128B, the digital signature of the service provider is provided for the data that consists of an electronic telephone card installation header 12817, which is header information indicating that the message is the electronic telephone card installation message 7904 and describing the data structure; a transaction number 12818; telephone card issuing information 12819, which concerns the telephone card issuing process performed by the telephone card issuing system; telephone card issuing information 12820, which concerns the telephone card issuing process performed by the service providing system; a request number 12821; generated electronic telephone card data 12822; a service provider ID 12823; and an issued time 12824, which indicates the date when the electronic telephone card installation message 7904 was issued. These data are closed and addressed to the user, thereby providing the electronic telephone card installation message 7904. The telephone card issuing information 12819 and the telephone card issuing information 12820 are accompanied by the digital signatures of the telephone card issuer and the service provider.

[2065] The mobile user terminal decrypts the received electronic telephone card installation message 7904 and examines the digital signature, registers, in the card list 1714, the electronic telephone card included in the electronic telephone card installation request 7904, and displays the installed electronic telephone card on the LCD (display the electronic telephone card; 7905).

[2066] An explanation will now be given for the contents of messages that are exchanged by the devices during the real credit clearing process for electronic credit card service.

[2067] In Fig. 84 are shown procedures for the exchange of messages by the devices during the real credit clearing processing, and in Figs. 135A to 135F, 136A to 136C, and 137A and 137B are shown the contents of the messages that are exchanged by the devices during the real credit clearing processing.

[2068] First, when the merchant presses the switch on the cash register for the credit card clearing (8401), the merchant terminal 102 or 103 generates multiple types of payment offer responses 8406 and enters the wait state for a payment offer 8405.

[2069] The payment offer responses 8406 are those used when an amount of payment entered by a user is insufficient, when a credit card or a payment option designated by the user is not available, or when the payment offer 8405 is accepted.

[2070] When the user performs a payment operation 8404, the mobile user terminal 100 generates the payment offer 8405 and transmits it to the merchant terminal 102 or 103 via infrared communication.

[2071] As is shown in Fig. 135A, the digital signature of a user is provided for data that consists of a payment offer header 13500, which is header information indicating that the message is the payment offer 8405 and describing the data structure; a payment service code 13501, which is a service code used to identify the type of electronic credit card designated by a user; a request number 13502, which is an arbitrarily generated number that uniquely represents the transaction with a merchant; an amount of payment 13504, which is entered by a user; a payment option code 13505, which is a payment option, such as the number of payments, entered by a user; an effective period 13506 for the payment offer 8405; and

an issued time 13507, which indicates the date on which the payment offer 8405 was issued. Thus, the payment offer 8405 is provided.

[2072] Upon receiving the payment offer 8405, the merchant terminal 102 or 103 examines the payment service code 13501, the amount of payment 13504 and the payment option 13505, and selects an appropriate payment offer response 8406 from among multiple types of responses 8406 and transmits it to the mobile user terminal via infrared communication. Further, the terminal 102 or 103 generates an authorization request 8409 and transmits it to the merchant processor of the service providing system 110.

[2073] As is shown in Fig. 135B, the digital signature of a merchant is provided for the data that consists of a payment offer response header 13508, which is header information indicating that the message is the payment offer response 8406 and describing the data structure; a response message 13509, which is displayed on the LCD 303 when the mobile user terminal 100 receives the payment offer response 8406; a transaction number 13510, which is an arbitrarily generated number that uniquely represents the transaction with a user; an amount of sales 13511; a service provider telephone number 13512, which is the telephone number of the service providing system in the service area of the merchant; an effective period 13513 for the payment offer response 8406; a merchant ID 13514; and an issued time 13515, which indicates the date on which the payment offer response 8406 was issued. In this fashion, the payment offer response 8406 is provided.

[2074] The service provider telephone number 13512 is accompanied by the digital signature of the service provider. The response message 13509 is a text message that is optionally selected by the merchant, and may not always be selected.

[2075] When the amount of payment designated by the user is insufficient, or when a credit card or a payment option entered by the user can not be accepted, the merchant terminal sets for the transaction number 13510 a value of "0," thus notifying the mobile user terminal that the payment offer 8405 can not be accepted.

[2076] As is shown in Fig. 135C, the digital signature of a merchant is provided for the data that consists of an authorization request header 13516, which is header information indicating that the message is the authorization request 8409 and describing the data structure; a payment offer 8405; a payment offer response 8406; an accounting machine ID 13517; a merchant ID 13518; and an issued time 13519, which indicates the date on which the authorization request 8409 was issued. These data are closed and addressed to the service provider, thereby providing the authorization request 8409.

[2077] The mobile user terminal 100 receives the payment offer response 8406, compares the amount of payment 13504 with the amount of sale 13511, generates a payment request 8410, and transmits it to the user processor of the service providing system via digital wireless telephone communication.

[2078] As is shown in Fig. 135D, the digital signature of a user is provided for the data that consists of a payment request header 13524, which is header information indicating that the message is the payment request 8410 and describing the data structure; a payment offer 8405; a payment offer response 8406; a user ID 13525; and an issued time 13526, which indicates the date on which the payment request 8410 was issued. These data are closed and addressed to the service provider, thereby providing the payment request 8410.

[2079] Either the transmission of the authorization request 8409 by the merchant terminal 102 or 103, or the transmission of the payment request 8410 by the mobile user terminal may be performed first, or the two of them may be performed at the same time.

[2080] The merchant processor and the user processor of the service providing system 110 receive the authorization request 8409 and the payment request 8410, decrypt them and examine the digital signatures, and transmit an authorization request 13520 and a payment request 13527 to the service manager processor. The service manager processor compares the request number, the transaction number and the merchant ID to obtain a correlation between the authorization request and the payment request, and generates the service director processor to form a process group for handling the authorization request 13520 and the payment request 13527. The service director processor compares the contents of the authorization request 13520 with those of the payment request 13527, authorizes the user and generates an authorization response 13540. The merchant processor closes the response 13540, addresses it to the merchant and transmits it as an authorization response 8411 to the merchant terminal.

[2081] As is shown in Fig. 135E, the digital signature of a service provider is provided for the data that consists of an authorization response header 13531, which is header information indicating that the message is the authorization response 8411 and describing the data structure; a transaction number 13532; an authorization number 13533, which is an arbitrarily generated number that uniquely represents the authorization processing; user personal data 13535; a customer number 13536; an effective period 13537, which designates a period during which the authorization response 8411 is effective; a service provider ID 13538; and an issued time 13539, which indicates the date on which the authorization response 8404 was issued. These data are closed and addressed to the merchant, thereby providing the authorization response 8411.

[2082] When, as the result of the authorization process, it is determined that the credit condition of the user is not satisfactory, the user personal data 13534 are not set. The customer number 13536 is set only when a transaction was previously made between the user and the merchant through an electronic commerce service.

[2083] The merchant terminal 102 or 103 decrypts the received authorization response 8411 and examines the digital signature, and displays the results of the authorization process on the LCD.

[2084] When an operator (merchant) performs a clearing request operation 8413, the merchant terminal generates a clearing request 8415 and transmits it to the merchant processor. As is shown in Fig. 135F, the digital signature of a merchant is provided for the data that consist of a clearing request header 13544, which is header information indicating that the message is the clearing request 8415 and describing the data structure; a payment offer 8405; a payment offer response 8406; an authorization number 13545, which is issued by the service providing system 110; an effective period 13546, which indicates a period during which the clearing request 8415 is effective; an accounting machine ID 13547; a merchant ID 13548; and an issued time 13549, which indicates the date on which the clearing request 8415 was issued. These data are closed and addressed to the service provider, thereby providing the clearing request 8415.

[2085] Upon receiving the clearing request 8415, the merchant processor of the service providing system 110 decrypts it and examines the digital signature, and transmits a clearing request 8450 to the service director processor. The service director processor compares the clearing request 8450 with the payment request 8427, and generates a clearing request 13610 for the transaction processor. The transaction processor closes the request 13610, addresses it to the transaction processor, and transmits it as a clearing request 8416 to the transaction processing system.

[2086] As is shown in Fig. 136A, the digital signature of a service provider is provided for data that consist of a clearing request header 13600, which is header information indicating that the message is the clearing request 8416 and describing the data structure; a user clearing account 13601, which indicates a credit card that corresponds to the payment service code designated by the user; a request number 13602, which is issued by the mobile user terminal 100; an amount of payment 13603; a payment option code 13604; a merchant clearing account 13605, which indicates a clearing account for the merchant; a transaction number 13606, which is issued by the merchant terminal; an effective period 13607, which indicates the period wherein the clearing request 8416 is effective; a service provider ID 13608; and an issued time 13609, which indicates the date on which the clearing request 8416 was issued. These data are closed and addressed to the transaction processor, thereby providing the clearing request 8416.

[2087] The transaction processing system 106 receives the clearing request 8416, decrypts it and examines the digital signature, and performs the clearing process. Then, the transaction processing system 106 generates a clearing completion notification 8417 and transmits it to the service providing system 110.

[2088] As is shown in Fig. 136B, the digital signature of a transaction processor is provided for data that consist of a clearing completion notification header 13614, which is header information indicating that the message is the clearing completion notification 8417 and describing the data structure; a clearing number 13615, which is an arbitrarily generated number that uniquely represents the clearing process performed by the transaction processing system 106; a user clearing account 13616; a request number 13617; an amount of payment 13618; a payment option code 13619; a merchant clearing account 13620; a transaction number 13621; clearing information 13622 for a service provider that is accompanied by the digital signature of the transaction processor; clearing information 13623 for a merchant that is accompanied by the digital signature of the transaction processor; clearing information 13624 for a user that is accompanied by the digital signature of the transaction processor; a transaction processor provider

ID 13625; and an issued time 13626, which indicates the date on which the clearing completion notification was issued. These data are closed and addressed to the service provider, thereby providing the clearing completion notification 8417.

[2089] Upon receiving the clearing completion notification 8417, the transaction processor processor of the service providing system 110 decrypts it and examines the digital signature, and transmits a clearing completion notification 13627 to the service director processor. Upon receiving the clearing completion notification 13627, the service director processor generates a clearing completion notification 13637 for the merchant. The merchant processor closes the clearing completion notification 13637, addresses it to the merchant, and transmits it to the merchant terminal as a clearing completion notification 8418 for the merchant.

[2090] As is shown in Fig. 136C, the digital signature of a service provider is provided for data that consist of a clearing completion notification header 13631, which is header information indicating that the message is the clearing completion notification 8418 and describing the data structure; a clearing number 13632; clearing information 13623 for a merchant that is accompanied by the digital signature of the transaction processor; a customer number 13633, which is an arbitrarily generated number that uniquely represents a user for a merchant; a decrypted clearing request 13550; provided service information 13634, which concerns the process performed by the service providing system 110; a service provider ID 13635; and an issued time 13636, which indicates the date on which the clearing completion notification 8418 was issued. These data are closed and addressed to the merchant, thereby providing the clearing completion notification 8418. The provided service information 13634 is set optionally by the service provider, and may not always be set.

[2091] Upon receiving the clearing completion notification 8418, the merchant terminal decrypts it and examines the digital signature, and generates a receipt 8419 and transmits it to the merchant processor.

[2092] As is shown in Fig. 137A, the digital signature of a merchant is provided for data that consist of a receipt header 13700, which is header information indicating that the message is the receipt 8419 and describing the data structure; an item name 13701, which indicates a product that is sold; sales information 13702, which is additional information concerning the transaction transmitted by the merchant to the user; a clearing number 13703; transaction information 13704; a payment offer 8405; an accounting machine ID 13705; a merchant ID 13706; and an issued time 13707, which indicates the date on which the receipt 8419 was issued. These data are closed and addressed to the service provider, thereby providing the receipt 8419. The sales information 13702 is set optionally by the merchant, and may not always be set.

[2093] Upon receiving the receipt 8419, the merchant processor of the service providing system 110 decrypts it and examines the digital signature, and transmits a receipt 13708 to the service director processor. The service director processor employs the receipt 13708 to generate a receipt 13717 for a user. The service director processor closes the receipt 13717 and addresses it to the user, and transmits it as a receipt 8421 to the mobile user terminal 100 via digital wireless telephone communication.

[2094] As is shown in Fig. 137B, the digital signature of a service provider is provided for data that consist of a receipt header 13712, which is header information indicating that the message is the receipt 8421 and describing the data structure; a user ID 13713; a decrypted receipt 13708; clearing information 13709 for a user that is accompanied by the digital signature of the transaction processor; provided service information 13714, which concerns the process performed by the service providing system 110; a service provider ID 13715; and an issued time 13716, which indicates the date on which the receipt 8421 was issued. These data are closed and addressed to the user, thereby providing the receipt 8421. The provided service information 13713 is set optionally by the service provider, and may not always be set.

[2095] Upon receiving the receipt 8421, the mobile user terminal 100 decrypts it and examines the digital signature, and displays the contents on the LCD 303. The real credit clearing process is thereafter terminated.

[2096] In the mobile user terminal 100, the ROM 1501 and the EEPROM 1503 may be replaced by ferroelectric nonvolatile memory as a memory device for storing a program executed by the CPU 1500 and the public key of the service provider. This memory device can store data without a battery being required, while like EEPROM or flash memory, data can be written to it. In addition, the reading and writing speeds of the ferroelectric nonvolatile memory are higher than those of EEPROM and flash memory, and the power consumption is low.

[2097] When the ferroelectric nonvolatile memory is employed instead of the ROM 1501 and the EEPROM 1503, in the same manner, for example, as in the data updating process, the program for the mobile user terminal 100 can be extensively updated, and the public key of the service provider can be periodically updated within a comparatively short period of time with little battery service life loss.

[2098] Furthermore, a ferroelectric nonvolatile memory may be used as the RAM 1502 to store the data that are to be processed and the data that are processed by the CPU 1500. Since data are not lost even when the battery power has been exhausted, a data backup process is not required, and the power supply required for storing the data resident in the RAM is not needed. As a result, the power consumed by the mobile user terminal can be reduced.

[2099] Also, a ferroelectric nonvolatile memory may be used instead of the ROM 3001 and the EEPROM 3003 in the merchant terminal 103, or the RAM 3002. In this case, the same effects are acquired as are obtained with the mobile user terminal 100.

[2100] In the above explanation, the mobile user terminal 100, the gate terminal 101 and the merchant terminals 102 and 103, which together constitute the mobile electronic commerce system, include an optimal hardware arrangement with which to implement the individual functions needed to provide the mobile electronic commerce service. These components can be constituted by a wireless telephone communication function, an infrared communication function, and a computer that comprises a display device, a keyboard (or an input pen), a microphone and a loudspeaker, and that further comprises a bar code reader for the merchant terminal 103.

[2101] In this case, functionally corresponding hardware components of the mobile user terminal 100, the gate terminal 101, or the merchant terminal 102 or 103 are modified for inclusion in a program for the hardware components that are not included in the computer (e.g., a data codec, a cryptographic processor and a logic control unit). This program, together with a program stored in the ROM 1501 (or 2201, 2601 or 3001), is converted so that it can be operated by the OS (Operating System) of a personal computer. The resultant program is then stored at a location (e.g., on a hard disk) where it can be accessed by the computer.

[2102] A second embodiment of the present invention will now be described while referring to Figs. 139 and 140.

[2103] In the mobile electronic commerce system in the second embodiment, instead of the EEPROM 1503 an SIM (Subscriber Identify Module) card is employed for the mobile user terminal 100 in the first embodiment.

[2104] Figs. 139A and 139B are a front view and a rear view of a mobile user terminal 13900 for the second embodiment, and Fig. 140 is a block diagram illustrating the arrangement of the mobile user terminal 13900. The arrangement of the mobile user terminal 13900 is the same as that of the mobile user terminal 100, except that an SIM card 14000 and an SIM card reader/writer 14001 are provided instead of the EEPROM 1503. The external appearance of the mobile user terminal 13900 is also the same as that of the mobile user terminal 100, except that an SIM card attachment section 13901 is provided on the reverse side for attaching the SIM card 14000.

[2105] The same information as is stored in the EEPROM 1503 in the first embodiment is stored in the nonvolatile memory of the SIM card 149000: the terminal ID and the telephone number of the mobile user terminal 13900 when used as a wireless telephone terminal; a user ID; a user code number; a private key and a public key used for a digital signature; a service provider ID; the telephone number of the service providing system 110 (which is accompanied by the digital signature of the service provider); and the public key of the service provider.

[2106] The SIM card 14000 can be carried separately from the mobile user terminal 13900. But without the SIM card 14000, if it has been removed, the mobile user terminal 13900 can not be operated. When the SIM card 14000 is attached to the SIM card reader/writer 14001, the CPU 1500 of the mobile user terminal 13900 accesses the information stored on the SIM card 14000 via the SIM card reader/writer 14001 and a bus 1529. The mobile user terminal 13900 then performs the same operations as does the mobile user terminal 100 in the first embodiment.

[2107] Further, to remove the SIM card 14000 from the mobile user terminal 13900, the following operation must be performed.

[2108] First, when a user depresses the power switch and holds it down for five seconds (removal operation 1 for the SIM card 14000), the mobile user terminal 13900 displays, on the LCD 303, a dialogue message requesting confirmation that the SIM card will be removed. Then, when the user depresses the execution switch (removal operation 2 for the SIM card 14000), the mobile user terminal 13900 performs a data updating process with the service providing system 110, and uploads the data from the RAM 1502 of the mobile user terminal 13900 to the user information server 902. When the user removes the SIM card 14000 from the SIM card reader/writer 14001 (removal operation 3 for the SIM card 14000), the mobile user terminal 13900 deletes all the data held in the RAM 1502.

[2109] Specifically, when the SIM card is removed from the mobile user terminal, the data, such as those for the electronic ticket and electronic payment card, that are stored in the RAM of the mobile user terminal are uploaded to the user information server 902 of the service providing system 110.

[2110] The following operation is performed when the SIM card 14000 is attached to the mobile user terminal 13900.

[2111] When the SIM card 14000 is connected to the SIM card reader/writer 14001, the mobile user terminal 13900 displays, on the LCD 303, a screen which permits the entry of a code number. When the user enters the code number and presses the execution switch, the code number stored in the nonvolatile memory of the SIM card 14000 is compared with the code number that was entered. When the two numbers do not match, the mobile user terminal 13900 again displays on the LCD 303 which permits the entry of the code number. When the two code numbers match, access to the SIM card 14000 is permitted. The mobile user terminal 13900 reads, from the SIM card 14000, the user ID, the private key used for the digital signature, the telephone number of the service providing system 110 and the public key of the service provider, and performs a data updating process with the service providing system 110 in order to update the data in the RAM 1502 of the mobile user terminal 13900. At this time, the data for the mobile user terminal in the user information server 902 are stored in the RAM 1502 of the mobile user terminal 13900, in accordance with the user ID stored on the SIM card 14000.

[2112] Specifically, the data for the mobile user terminal, such as the data for the electronic ticket or for the electronic payment card that are uploaded to the user information server 902 of the service providing system 110, are downloaded to the mobile user terminal to which the SIM card is attached. When, for example, an SIM card is attached to a mobile user terminal that differs from the mobile user terminal to which the SIM card was previously attached, the same data as those stored in the RAM of the mobile user terminal to which the SIM card was previously attached are stored in the RAM of the mobile user terminal to which the SIM card is currently attached.

[2113] Therefore, the user can carry the SIM card 14000 on which the user ID is stored, and can employ an arbitrary mobile user terminal as his or her own by attaching the SIM card to that mobile user terminal.

[2114] In the mobile user terminal 13900, not only the areas used for storing the user ID and the code number, but also areas that correspond to the basic program area 1700 of the RAM 1502, the service data area 1701, the user area 1702 and the temporary area 1704 may be provided for the nonvolatile memory of the SIM card 14000, so that the data stored in these areas in the RAM 1502 may be stored in the nonvolatile memory of the SIM card 14000. In this case, the data for the electronic ticket or the electronic payment card are stored in the nonvolatile memory of the SIM card 14000, and the RAM 1502 is a work area that is used by the CPU 1500 when executing a program.

[2115] Since the data stored in the RAM 1502, other than in the work area 1703 of the mobile user terminal 100 of the first embodiment, are held in the nonvolatile memory of the SIM card 14000, the data updating process, which is performed when the SIM card is attached and removed, is not required, and as a power source for holding data is also not required, the power consumed by the mobile user terminal can be reduced.

[2116] A ferroelectric memory may be used as the nonvolatile memory for the SIM card 14000. Since the reading and writing speeds of the ferroelectric nonvolatile memory are higher than are those of EEPROM and flash memory, and since the power consumption is low, the processing speed of the mobile user terminal can be increased and its power consumption can be reduced.

[2117] A third embodiment will now be described while referring to Figs. 141 to 143.

[2118] According to the third embodiment, a mobile electronic commerce system is provided that includes an IC card reader/writer and that employs, as a mobile user terminal, a portable wireless telephone terminal wherein an electronic ticket, an electronic payment card or an electronic telephone card that the user obtains is stored in an IC card loaded into the telephone terminal.

[2119] Figs. 141A and 141B are a front view and a rear view of a mobile user terminal 14100 according to the third embodiment, and Fig. 142 is a block diagram illustrating the arrangement of the mobile user terminal 14100. The external appearance of the mobile user terminal 13900 is the same as that of the mobile user terminal 100, except that an IC card insertion slot 14101 is formed in the reverse side for loading the IC card 14100. The arrangement of the mobile user terminal 14100 is the same as that of the mobile user terminal 100, except that the cryptographic processor 1505 is replaced by an IC card reader/writer 14200. When the IC card 14102 is loaded into the IC card reader/writer 14200, the mobile user terminal 14100 performs the same operations as does the mobile user terminal 100 in the first embodiment for the other devices, such as the service providing system 110, the gate terminal 101, the merchant terminals 102 and 103, the automatic vending machine 104 and the switching center 105.

[2120] It should be noted that the mobile user terminal 14100 performs the following operation when the IC card 14102 is loaded therein.

[2121] When the IC card 14102 is loaded in the IC card reader/writer 14200, the mobile user terminal 14100 displays, on the LCD 303, a screen permitting the entry of a code number. When the user enters the code number and presses the execution switch, the code number stored in the IC card 14102 is compared with the code number that was entered. When the two numbers do not match, the mobile user terminal 14100 again displays, on the LCD 303, the screen permitting the entry of a code number. When the two code numbers match, access to the IC card 14102 is permitted.

[2122] For the mobile user terminal 14100, the user ID and the user code number, the private key and the public key used for a digital signature, the service provider ID, the telephone number of the service providing system 110 and the public key of the service provider are stored in the IC card 14102, while the terminal ID and the telephone number of the mobile user terminal 14100 when used as a wireless telephone terminal are stored in the EEPROM 1503.

[2123] In addition, an additional program and the data for the electronic ticket or the electronic payment card, which are stored in the basic program area 1700, the service data area 1701, the user area 1702 and the temporary area 1704 in the RAM 1502 of the mobile user terminal 100 of the first embodiment, are stored on the IC card 14102 of the mobile user terminal 14100. The RAM 1502 of the mobile user terminal 14100 serves as a work area that is used by the CPU 1500 when executing a program.

[2124] Furthermore, the mobile user terminal 14100 employs the IC card 14100 loaded into the IC card reader/writer 14200 to perform one part of the data processing for the messages that are exchanged with the service providing system 110, the gate terminal 101, the merchant terminals 102 and 103, the automatic vending machine 104 or the switching center 105 for the mobile electronic commerce service.

[2125] Fig. 143 is a block diagram illustrating the arrangement of the IC card 14102.

[2126] The IC card 14102 includes two interfaces, one for a contact type IC card and one for a non-contact IC card. This IC card comprises: a CPU (Central Processing Unit) 14300, which processes data to be transmitted and data that are received in accordance with a program stored in a ROM (Read Only Memory) 14301, and which controls the other components across a bus 14318; a RAM (Random Access Memory) 14302, in which are stored data that are to be processed and that are being processed by the CPU 14300; an FeRAM (Ferroelectric Random Access Memory) 14303, in which are stored a user ID and a code number for a user, a private key and a public key for a digital signature, a service provider ID, the telephone number of the service providing system 110, the public key of the service provider, and an additional program or data such as those for an electronic ticket or for an electronic payment card, which are stored in the basic program area 1700, the service data area 1701, the user area 1702 and the temporary area 1704 of the RAM 1502 of the first embodiment; a cryptographic processor 14304, which encrypts or decrypts data under the control of the CPU 14300; an input/output circuit 14305, which converts and controls a signal that is input or output at a contact 14306 of a non-contact IC card under the control of the CPU

14300; and an RF modem 14307, which converts and controls radio waves that are input or output by an antenna 14308 of a non-contact IC card under the control of the CPU 14300.

[2127] The cryptographic processor 14304, which corresponds to the cryptographic processor 1505 of the mobile user terminal 100 in the first embodiment, includes an encryption and decryption function that uses a secret key method and an encryption and decryption function for a public key system. The cryptographic processor 14304 employs the cryptograph method and keys that are set by the CPU 14300 to encrypt or decrypt data as designated by the CPU 14300. The cryptographic function of the cryptographic processor 14304 is employed for the process for providing a digital signature for a message or the process for closing the message, and the process for decrypting the closed message or the process for verifying a digital signature accompanying the message.

[2128] To transmit, via a digital wireless telephone communication, a message that is closed and is accompanied by a digital signature, first, the CPU 14300 employs the cryptographic processor 14304 to perform the digital signature provision process and the message closing process, and transmits the resultant message to the input/output circuit 14305. The message, which is closed and is accompanied by the digital signature, is converted into an electric signal by the input/output circuit 14305, and the electric signal is output at the contact point 14306. Through the IC card reader/writer 14200 and the bus 1529, the CPU 1500 reads, as a message, the electric signal that is output at the contact 14306. The CPU 14300 employs the data codec 1506 to encode the message that is closed and accompanied by the digital signature to obtain a data form for digital wireless telephone communication, and transmits the coded message via the control logic unit 1508 to the channel codec 1513.

*[2129] When a message that is closed and is accompanied by a digital signature is received via digital wireless telephone communication, the CPU 1500 reads the received message from the channel codec 1513 through the control logic unit 1508, employs the data codec 1506 to decrypt the received message, and transmits the decrypted message to the IC card 14102 via the bus 1529 and the IC card reader/writer 14200. The CPU 14300 receives a message via the contact point 14306 and the input/output circuit 14305, and employs the cryptographic processor 14304 to decrypt the closed and encrypted message and to examine the digital signature accompanying the message.

[2130] Similarly, to transmit via infrared communication a message that is closed and is accompanied by a digital signature, first, the CPU 14300 employs the cryptographic processor 14304 to perform the digital signature provision process and the message closing process, and transmits the resultant message to the input/output circuit 14305. The message that is closed and is accompanied by the digital signature is converted into an electric signal by the input/output circuit 14305, and the electric signal is output at the contact point 14306. Through the IC card reader/writer 14200 and the bus 1529, the CPU 1500 reads, as a message, the electric signal that is output at the contact 14306. The CPU 14300 employs the data codec 1506 to encode the message that is closed and is accompanied by the digital signature to obtain a data form for infrared communication, and transmits the coded message to the infrared communication module 1507.

[2131] When a message that is closed and is accompanied by a digital signature is received via infrared communication, the CPU 1500 reads the received message from the infrared communication module 1507, employs the data codec 1506 to decrypt the received message, and transmits the decrypted message to the IC card 14102 via the bus 1529 and the IC card reader/writer 14200. The CPU 14300 receives a message via the contact point 14306 and the input/output circuit 14305, and employs the cryptographic processor 14304 to decrypt the closed and encrypted message and to examine the digital signature accompanying the message.

[2132] In Fig. 144 is shown a memory map for the FeRAM 14303. The FeRAM 14303 includes five areas: a security area 14400, a basic program area 14401, a service data area 14402, a user area 14403 and a temporary area 14403. The security area 14400 is used to store a user ID, a user code number, a private key and a public key for a digital signature, a service provider ID, the telephone number of the service providing system (that is accompanied by the digital signature of the service provider), and the public key of the service provider. The basic program area 14401, the service data area 14402, the user area 14403 and the temporary area 14404 correspond to the basic program area 1700, the service data area 1701, the user area 1702 and the temporary area 1704 in the RAM 1502 of the mobile user terminal 100 for the first embodiment, and the same data are stored in these areas as are stored in the first embodiment. That is, all the information used for the mobile electronic commerce service, such as the user ID, the keys for the

digital signature, or the electronic ticket or the electronic payment card that the user obtained, are stored on the IC card 14102.

[2133] Therefore, the user can carry the IC card 14102 in which the user ID is stored, and can perform the electronic commerce service function, while using an arbitrary mobile user terminal that is regarded as his or her own, by loading the IC card 14102 into that mobile user terminal.

[2134] In addition, since the mobile user terminal 14100 can not access the IC card 14102 when it is not loaded, the mobile user terminal 14100 can not process message data obtained through the mobile electronic commerce service. Therefore, in this case, the mobile electronic commerce service function of the mobile user terminal 100 can not be employed, and only the digital wireless telephone function can be used.

[2135] In Fig. 141C is shown the screen that is displayed on the LCD 303 in the digital wireless telephone mode when the IC card 14102 is not loaded, and in Fig. 141D is shown the screen that is displayed on the LCD 303 in the credit card mode when the IC card 14102 is loaded.

INDUSTRIAL USABILITY

[2136] As is apparent from the above description, the mobile electronic commerce system according to the present invention can download to the electronic wallet an electronic negotiable card, such as a payment card, a telephone card or a ticket, through the communication means, and can easily obtain such a card. When the electronic payment card, the electronic telephone card or the electronic ticket is to be used, the settlement process or the examination process is quickly and precisely performed, so that safety and usability for a business transaction can be provided.

[2137] The performance of an illegal activity during a business transaction can be prevented, and the secrecy of personal information can be maintained.

[2138] The electronic payment card, the electronic telephone card and the electronic ticket can be delivered along a distribution route as a form of printed matter or as a recording medium, and wide distribution is possible.

[2139] In addition, the usability in the mobile environment can be improved, and, particularly in the invention cited in claims 24 and 25, a system appropriate to the environment in which it is to be used can be obtained.

[2140] According to the invention cited in claim 27, cash is not required to purchase a product from an automatic vending machine, and the usability can be improved.

[2141] According to the invention cited in claim 28, the operator is able to manipulate the electronic payment card clearing means and to present, to a person in charge, the data stored in the electronic payment card clearing means. Thus, the usability of the electronic payment card clearing means is improved.

[2142] According to the invention cited in claim 30, since the calculation of the price of a product and the settlement process can be preformed, the usability is improved.

[2143] According to the invention cited in claim 31, since the process beginning with the promotion of a product and continuing until the product is sold is automated, the usability is improved.

[2144] According to the invention cited in claim 32, the provision of a communication service and the collection of a communication charge for that service can be performed at the same time, and the collection rate for the communication charge can be improved.

[2145] According to the invention cited in claim 33, the operator is able to operate the electronic ticket means and to present, to a person in charge, the data stored in the electronic ticket means. Thus, the usability of the electronic ticket means is improved.

[2146] According to the invention cited in claim 34, the service providing means can efficiently manage the electronic wallet and the electronic payment card clearing means, and can provide the electronic payment card service, the electronic telephone card service and the electronic ticket service.

[2147] According to the invention cited in claim 35, the settlement means can efficiently perform the settlement means.

[2148] According to the invention cited in claim 36, the payment card issuing means can efficiently issue a payment card.

[2149] According to the invention cited in claim 37, the telephone card issuing means can efficiently issue a telephone card.

[2150] According to the invention cited in claim 38, the ticket issuing means can efficiently issue a ticket.

[2151] According to the invention cited in claim 39, the owner of the electronic wallet purchases, as an electronic payment card, a payment card that is issued by the payment card issuing means, and can download the payment card to the electronic wallet and use it. Thus, the usability is improved.

[2152] According to the invention cited in claim 40, since the owner of the electronic wallet designates the amount of a payment, an illegal act by a store can be prevented.

[2153] According to the invention cited in claim 41, the owner of the electronic wallet can confirm the contents of a trading session, and as a statement of account printed on paper need not be exchanged, a sale can be handled more efficiently.

[2154] According to the invention cited in claim 42, the owner of an electronic wallet can purchase anywhere, as an electronic telephone card, a telephone card that is issued by the telephone card issuing means, and can use the telephone card by downloading it to the electronic wallet. Thus, the usability is improved.

[2155] According to the invention cited in claim 43, a wireless communication service using a payment card clearing method can be received, and the usability is improved.

[2156] According to the invention cited in claim 44, the owner of an electronic wallet can confirm the contents of the wireless communication service that is employed.

[2157] According to the invention cited in claim 45, the owner of an electronic wallet can purchase anywhere, as an electronic ticket, a ticket that is issued by the ticket issuing means, and can use the ticket by downloading it to the electronic wallet. Thus, the usability is improved.

[2158] According to the invention cited in claims 47 and 48, the ticket can be examined accurately and efficiently.

[2159] According to the invention cited in claim 49, since an electronic payment card can be transferred to another person, the usability is improved.

[2160] According to the invention cited in claim 50, an electronic payment card can be precisely transferred and trouble that may accompany the transfer can be prevented.

[2161] According to the invention cited in claim 51, since an electronic telephone card can be transferred to another person, the usability is improved.

[2162] According to the invention cited in claim 52, an electronic telephone card can be precisely transferred and trouble that may accompany the transfer can be prevented.

[2163] According to the invention cited in claim 53, since an electronic ticket can be transferred to another person, the usability is improved.

[2164] According to the invention cited in claim 54, an electronic ticket can be precisely transferred and trouble that may accompany the transfer can be prevented.

[2165] According to the invention cited in claim 55, the owner of an electronic wallet can install an electronic payment card in the electronic wallet anywhere.

[2166] According to the invention cited in claim 56, an electronic payment card that the owner of the electronic wallet designates can be installed in the electronic wallet anywhere.

[2167] According to the invention cited in claim 57, the owner of the electronic wallet can install an electronic telephone card in the electronic wallet anywhere.

[2168] According to the invention cited in claim 58, an electronic telephone card that the owner of the electronic wallet designates can be installed in the electronic wallet anywhere.

[2169] According to the invention cited in claim 59, the owner of the electronic wallet can install an electronic ticket in the electronic wallet anywhere.

[2170] According to the invention cited in claim 60, an electronic ticket that the owner of the electronic wallet designates can be installed in the electronic wallet anywhere.

[2171] According to the invention cited in claim 61, an illegal installation due to immorality can be prevented.

[2172] According to the invention cited in claim 62, a maximum one hundred million types of electronic payment cards, electronic telephone cards and electronic tickets, and 10 to the 32nd power of cards or tickets of for each type can be identified by simple numerical entry.

[2173] According to the invention cited in claim 63, the owner of the electronic wallet can reduce the communication costs for a purchase, and can also receive, as a gift, an electronic payment card, an electronic telephone card or an electronic ticket. As a result, the distribution and employment of an electronic payment card, an electronic telephone card or an electronic ticket can be accelerated.

[2174] According to the invention cited in claim 64, the distribution and employment of the electronic payment card, the electronic telephone card or the electronic ticket can be accelerated.

[2175] According to the invention cited in claim 65, the contents of a ticket that has been issued can be changed at a low cost.

[2176] According to the invention cited in claim 66, the modification of the contents of an event can be reported to the owner of the electronic ticket, and the electronic ticket can be updated.

[2177] According to the invention cited in claim 67, the owner of the electronic ticket does not have to go to a ticket store for a refund, and can receive the refund anywhere.

[2178] According to the invention cited in claim 68, the calculation function of a computer system can be efficiently distributed to individual information processing means.

[2179] According to the invention cited in claim 69, an electronic payment card to be used and an electronic payment card in the sleeping state can be managed separately, and an efficient service operation is enabled.

[2180] According to the invention cited in claim 70, since an electronic payment card must be registered to be used, even when an unregistered electronic payment card in the sleeping state is stolen, illegal use of that card will not occur.

[2181] According to the invention cited in claim 71, an electronic telephone card to be used and an electronic telephone card in the sleeping state can be managed separately, and an efficient service operation is enabled.

[2182] According to the invention cited in claim 72, since an electronic telephone card must be registered to be used, even when an unregistered electronic telephone card in the sleeping state is stolen, illegal use of that card will not occur.

[2183] According to the invention cited in claim 73, an electronic ticket to be used and an electronic ticket in the sleeping state can be managed separately, and an efficient service operation is enabled.

[2184] According to the invention cited in claim 74, since an electronic ticket must be registered for use, even when an unregistered electronic ticket in the sleeping state is stolen, illegal use of that card will not occur.

[2185] According to the invention cited in claim 75, clearing of the electronic payment card and the transfer of the electronic payment card can be safely performed.

[2186] According to the invention cited in claim 76, the verification process can be mutually performed by the electronic wallet and the electronic payment card clearing means, and the safety of payment card clearing is improved.

[2187] According to the invention cited in claims 78 and 80, various types of electronic payment cards can be safely issued.

[2188] According to the invention cited in claim 79, various types of electronic payment cards can be safely issued by individual payment card issuers.

[2189] According to the invention cited in claim 81, settlement of the communication charge using the electronic telephone card and the transfer of the electronic telephone card can be safely performed.

[2190] According to the invention cited in claim 82, a message generated by the electronic telephone card can be accompanied by the digital signature of the electronic telephone card, and the validity of the message can be verified.

[2191] According to the invention cited in claim 83, the verification process can be mutually performed by the electronic wallet and the electronic telephone card clearing means, and the safety of telephone card clearing is improved.

[2192] According to the invention cited in claims 84 and 86, various types of electronic telephone cards can be safely issued.

[2193] According to the invention cited in claim 85, various types of electronic telephone cards can be safely issued by individual telephone card issuers.

[2194] According to the invention cited in claim 87, the examination of an electronic ticket and the transfer of the electronic ticket can be safely performed.

[2195] According to the invention cited in claim 88, a message generated by the electronic ticket can be accompanied by the digital signature of the electronic ticket, and the validity of the message can be verified.

[2196] According to the invention cited in claim 89, the verification process can be mutually performed by the electronic wallet and the electronic ticket examination means, and the safety of ticket examination is improved.

[2197] According to the invention cited in claims 90 and 92, various types of electronic tickets can be safely issued.

[2198] According to the invention cited in claim 91, various types of electronic tickets can be safely issued by individual ticket issuers.

[2199] According to the invention cited in claim 93, a payment method can be selected when an electronic payment card is purchased, and the usability is improved.

[2200] According to the invention cited in claim 94, the payment card issuing means can designate a template program that is used for the electronic payment card, and various types of electronic payment cards can be issued.

[2201] According to the invention cited in claim 95, the representative component information can be designated when an electronic payment card is issued, and various types of electronic payment cards having a high degree of freedom can be issued.

[2202] According to the invention cited in claim 96, since the signature key of the electronic payment card is updated by registering the card, the safety is improved.

[2203] According to the invention cited in claim 97, an electronic payment card that is to be used can be selected, and the usability is improved.

[2204] According to the invention cited in claim 98, since a value that is equal to or greater than the amount of a payment designated by the owner of the electronic wallet is not paid, the safety is improved.

[2205] According to the invention cited in claim 99, since the contents of an electronic payment card used for the payment are precisely represented for the electronic payment card clearing means, the electronic payment card clearing means can determine whether the pertinent electronic payment card is valid.

[2206] According to the invention cited in claim 100, the amount of a payment and a person who is to receive the payment are guaranteed, and an illegal charge by a store can be prevented.

[2207] According to the invention cited in claim 101, whether a micro-check is issued by the owner of the electronic payment card is determined, and the validity of the micro-check can be exactly verified.

[2208] According to the invention cited in claim 102, the generation order for a micro-check and the matching of the remaining value can be examined, and further, the validity of the micro-check can be precisely examined.

[2209] According to the invention cited in claim 103, a used micro-check can be automatically collected, and its validity can be examined.

[2210] According to the invention cited in claim 104, the transferring side and the recipient side can negotiate the contents to be transferred.

[2211] According to the invention cited in claim 105, the recipient side can confirm the contents of an electronic payment card to be transferred.

[2212] According to the invention cited in claim 106, since the recipient is guaranteed, even when a payment card transfer certificate message is stolen, the payment card will not be illegally employed.

[2213] According to the invention cited in claim 107, a payment method can be selected when an electronic telephone card is purchased, and the usability is improved.

[2214] According to the invention cited in claim 108, the telephone card issuing means can designate a template program that is used for the electronic telephone card, and various types of electronic telephone cards can be issued.

[2215] According to the invention cited in claim 109, the representative component information can be designated when an electronic telephone card is issued, and various types of electronic telephone cards having a high degree of freedom can be issued.

[2216] According to the invention cited in claim 110, since the signature key of the electronic telephone card is updated by registering the card, the safety is improved.

[2217] According to the invention cited in claim 111, an electronic telephone card that is to be used can be selected, and the usability is improved.

[2218] According to the invention cited in claim 112, the communication service provider can charge a fee in accordance with a wireless communication service that is provided.

[2219] According to the invention cited in claim 113, only a small amount of history information is required,

even when the settlement of additional charges is performed many times during a communication session.

[2220] According to the invention cited in claim 114, since the contents of an electronic telephone card used for payment are precisely represented for the electronic telephone card clearing means, the electronic telephone card clearing means can determine whether the pertinent electronic telephone card is valid.

[2221] According to the invention cited in claim 115, the amount of a payment and a person who is to receive the payment are guaranteed, and an illegal charge by the owner of the electronic telephone card can be prevented.

[2222] According to the invention cited in claim 116, whether a telephone micro-check is issued by the owner of the electronic telephone card is determined, and the validity of the telephone micro-check can be exactly verified.

[2223] According to the invention cited in claim 117, the generation order for a telephone micro-check and the matching of the remaining value can be examined, and the validity of the telephone micro-check can be further precisely examined.

[2224] According to the invention cited in claim 118, a used telephone micro-check can be automatically collected, and the validity can be examined.

[2225] According to the invention cited in claim 119, the transferring side and the recipient side can negotiate the contents to be transferred.

[2226] According to the invention cited in claim 120, the recipient side can confirm the contents of an electronic telephone card that is to be transferred.

[2227] According to the invention cited in claim 121, since the recipient is guaranteed, even when a payment card transfer certificate message is stolen, the payment card will not be illegally employed.

[2228] According to the invention cited in claim 122, a payment method can be selected when an electronic ticket is purchased, and the usability is improved.

[2229] According to the invention cited in claim 123, the ticket issuing means can designate a template program that is used for the electronic ticket, and various types of electronic tickets can be issued.

[2230] According to the invention cited in claim 124, the representative component information can be designated when an electronic ticket is issued, and various types of electronic tickets having a high degree of freedom can be issued.

[2231] According to the invention cited in claim 125, since the signature key of the electronic ticket is updated by registering the ticket, the safety is improved.

[2232] According to the invention cited in claim 126, an electronic ticket that is to be used can be selected, and the usability is improved.

[2233] According to the invention cited in claim 127, the electronic ticket examination means can perform the examination process in accordance with a ticket that is presented.

[2234] According to the invention cited in claim 128, since the contents of an electronic ticket to be used are precisely represented for the electronic ticket examination means, the electronic ticket examination means can determine whether the pertinent electronic ticket is valid.

[2235] According to the invention cited in claim 129, the contents of the electronic ticket that is examined is guaranteed, and an illegal charge by the owner of the electronic ticket can be prevented.

[2236] According to the invention cited in claim 130, whether a ticket examination response message is issued by the owner of the electronic ticket is determined, and the validity of the ticket examination response can be exactly verified.

[2237] According to the invention cited in claim 131, the generation order for a ticket examination response

message and the matching of the changes of the statuses can be examined, and the validity of the ticket examination response message can be precisely examined.

[2238] According to the invention cited in claim 132, a ticket examination response can be automatically collected, and the validity can be examined.

[2239] According to the invention cited in claim 133, the transferring side and the recipient side can negotiate the contents to be transferred.

[2240] According to the invention cited in claim 134, the recipient side can confirm the contents of an electronic ticket that is to be transferred.

[2241] According to the invention cited in claim 135, since the recipient is guaranteed, even when a ticket transfer certificate message is stolen, the ticket will not be illegally employed.

[2242] According to the invention cited in claim 136, the payment card issuer, the telephone card issuer and the ticket issuer can designate the procedures for clearing.

[2243] According to the invention cited in claim 137, an electronic payment card, an electronic telephone card and an electronic ticket can be issued without keeping a purchaser waiting.

[2244] According to the invention cited in claim 138, an electronic payment card, an electronic telephone card and an electronic ticket can be issued without keeping a purchaser waiting.

[2245] According to the invention cited in claim 139, a plurality of electronic payment cards, electronic telephone cards and electronic tickets, and history information can also be managed in the memory of an electronic wallet that has a limited capability.

[2246] According to the invention cited in claim 140 and 141, the service life of a battery for the electronic wallet or for the electronic payment card clearing means can be extended.

[2247] According to the invention cited in claim 144, the counterfeiting of printed material can be prevented. Further, according to the invention for a recording medium on which are stored various programs, such as a control program for the central processing unit of the electronic wallet, these programs can be distributed in a portable form.

[2248] According to the invention cited in claim 155, the third storage means for storing the identification information and authorization information for a user is loaded into an arbitrary electronic wallet, so that the electronic wallet can be used as the electronic wallet of that user.

[2249] According to the invention cited in claim 156, communication with the service providing means is not required when the third storage means is to be loaded into and unloaded from the electronic wallet.

[2250] According to the invention cited in claim 157, an electronic negotiable card that is obtained using the electronic wallet can be carried while stored in the IC card.

[2251] According to the invention of printed material on which is printed electronic payment installation information, electronic telephone card installation information or electronic ticket installation information, and a recording medium on which such information is stored, an electronic payment card, an electronic telephone card or an electronic ticket can be transmitted along a distribution route.

[2252] The printed material to which the removable coating is applied can prevent the leakage of installation information before this printed material is purchased.

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MOBILE ELECTRONIC COMMERCE SYSTEMClaims of corresponding document: **EP0950968**

Translate this text

1. A mobile electronic commerce system for paying, via wireless communication means, a required amount from an electronic wallet that includes said wireless communication means and for receiving a product or a service, or a required permission, from a supply side, comprising:

service means for connecting said electronic wallet and said supply side via said communication means, wherein said service means installs, via said communication means, a program for an electronic negotiable card in said electronic wallet;

wherein said electronic negotiable card that is installed is employed to receive a product or a service, or a required permission, from said supply side;

wherein based on a program for said electronic negotiable card a settlement process for which said electronic negotiable card is used, is performed by said electronic wallet and said supply side via said communication means; and

wherein, in association with said settlement process, said data that are stored in said electronic wallet and at said supply side are transmitted to said service means at a predetermined time, and are managed thereat.

2. A mobile electronic commerce system for paying, via wireless communication means, a required amount using an electronic wallet that includes said wireless communication means and for receiving a product or a service, or a required permission, from a supply side,

wherein, via said wireless communication means, said electronic wallet applies the purchase of a program for an electronic negotiable card to service means for issuing said program for said electronic negotiable card;

wherein said service means receives from electronic negotiable card issuing means data concerning said electronic negotiable card, and with settlement means performs a settlement that is associated with the purchase of said electronic negotiable card;

wherein, via said wireless communication means, said program for said electronic negotiable card is installed in said electronic wallet;

wherein said electronic negotiable card that is installed is employed for receiving a product or a service, or a required permission, from said supply side; and

wherein, based on said program for said negotiable card, a settlement process based on the use of said negotiable card is performed by said electronic wallet and said supply side via said communication means.

3. A mobile electronic commerce system according to claim 1 or 2, wherein, in said settlement process for which said negotiable card is used, said electronic wallet generates an electronic check corresponding to a payment amount based on said program provided for said negotiable card, and transmits said electronic check to said supply side via said wireless communication means; wherein said supply side, upon receiving said electronic check, transmits an electronic receipt to said electronic wallet; wherein, thereafter, said electronic wallet and said supply side respectively store said electronic receipt and said electronic check as data concerning said settlement process.

4. A mobile electronic commerce system according to claim 1 or 2, wherein, in said settlement process for which said electronic negotiable card is used, based on said program provided for said electronic negotiable card said electronic wallet transmits data for said electronic negotiable card to said supply side via said wireless communication means; wherein said supply side, upon receiving said data for said electronic negotiable card, transmits to said electronic wallet an electronic certificate required for the granting of entrance permission and the admission of the owner of said electronic wallet; and wherein, thereafter, said electronic wallet and said supply side respectively store said electronic certificate and said data for said electronic negotiable card as data concerning said settlement process.

5. A mobile electronic commerce system according to claim 1 or 2, wherein, in order to transfer said electronic negotiable card that is installed in said electronic wallet to a different electronic wallet, said electronic wallet generates a transfer message using said electronic negotiable card and transmits said message to said different electronic wallet; wherein said electronic wallet deletes said stored electronic

negotiable card, and said different electronic wallet transmits, to said service means, said transfer message for said negotiable card; wherein, thereafter, said service means installs a program for said electronic negotiable card in said different electronic wallet.

6. A mobile electronic commerce system according to claim 1 or 2, wherein said electronic wallet transmits to said service means, via said wireless communication means, an installation number to be recorded on or in a distribution medium, such as printed matter or a recording medium; and wherein said service means receives, from negotiable card issuing means, data concerning an electronic negotiable card that is to be issued, and through wireless communication installs a program for an electronic negotiable card corresponding to said installation number.

7. A mobile electronic commerce system according to claim 1 or 2, wherein said service means manages a template program that is a model of a program for an electronic negotiable card, and based on said template program generates said program for said electronic negotiable card and installs said program in said electronic wallet.

8. A mobile electronic commerce system for paying, via wireless communication means, a required amount from an electronic wallet that includes said wireless communication means and for receiving a product or a service, or a required permission, from a supply side, wherein a program for an electronic negotiable card includes an inherent private key, and wherein, when an electronic wallet employs said negotiable card, said private key is employed to add a digital signature to data that are to be transmitted to a supply side via communication means.

9. A mobile electronic commerce system for paying, via wireless communication means, a required amount from an electronic wallet that includes said wireless communication means, and for receiving a product or a service, or a required permission, from a supply side, wherein said electronic wallet holds an electronic payment card that serves as an electronic payment card program, and employs said electronic payment card when paying said required amount for said product or said service that is received from said supply side; and wherein, via said wireless communication means, said electronic wallet and said supply side perform a settlement process that is associated with said payment.

10. A mobile electronic commerce system according to claim 9, wherein an electronic payment card settlement means for making a payment using said electronic payment card is provided for said supply side.

11. A mobile electronic commerce system according to claim 10, wherein service means is provided to connect, via said communication means, said electronic wallet and said electronic payment card settlement means and to connect, via said communication means, said payment card issuing means and said settlement means, so that said electronic wallet can purchase said electronic payment card through said service means.

12. A mobile electronic commerce system according to claim 11, wherein said electronic wallet, said electronic payment card settlement means, and said service means individually include a plurality of types of communication means, and wherein said electronic wallet, said electronic payment card settlement means, and said service means employ different communication means when communication among the three is conducted.

13. A mobile electronic commerce system for paying, via wireless communication means, a required amount from an electronic wallet that includes said wireless communication means and for receiving a product or a service, or a required permission, from a supply side, wherein said electronic wallet holds an electronic telephone card that serves as an electronic telephone card program, and employs said electronic telephone card when paying a required amount for a communication that is performed via wireless communication means using an exchange service provided by said supply side; and wherein said electronic wallet and said supply side perform, via said wireless communication means, a settlement process that accompanies said payment.

14. A mobile electronic commerce system according to claim 13, wherein said supply side includes communication line exchange means and electronic telephone card settlement means for settling said payment using said electronic telephone card.

15. A mobile electronic commerce system according to claim 14, wherein service means is provided for connecting, via said communication means, said electronic wallet and said electronic payment card settlement means, and for connecting, via said communication means, said payment card issuing means and said settlement means, so that said electronic wallet can purchase said electronic telephone card through said service means.

16. A mobile electronic commerce system according to claim 15, wherein said electronic wallet, said electronic telephone card settlement means, and said service means individually include a plurality of types of communication means, and wherein said electronic wallet, said electronic telephone card settlement means, and said service means employ different communication means when communication among the three is conducted.

17. A mobile electronic commerce system for paying, via wireless communication means, a required amount from an electronic wallet that includes said wireless communication means and for receiving a product or a service, or a required permission, from a supply side, wherein said electronic wallet holds an electronic ticket that is electronically constituted, and provides information concerning said electronic ticket; and wherein said electronic wallet and said supply side perform, via said wireless communication means, an examination process for said electronic ticket for granting permission for an admission.

18. A mobile electronic commerce system according to claim 17, wherein electronic ticket examination means for examining said electronic ticket is provided for said supply side.

19. A mobile electronic commerce system according to claim 18, wherein service means is provided for connecting, via said communication means, said electronic wallet and said electronic ticket examination means, and for connecting, via said communication means, said ticket issuing means and said settlement means, so that said electronic wallet can purchase said electronic ticket through said service means.

20. A mobile electronic commerce system according to claim 18, wherein said electronic wallet, said electronic ticket examination means, and said service means individually include a plurality of types of communication means, and wherein said electronic wallet, said electronic ticket examination means, and said service means employ different communication means when communication among the three is performed.

21. A mobile electronic commerce system comprising:

said electronic wallet defined in claim 9;
electronic payment card settlement means;
electronic telephone card settlement means;
electronic ticket examination means;
service provision means;
settlement processing means;
payment card issuing means;
telephone card issuing means; and
ticket issuing means.

22. A mobile electronic commerce system according to claim 11, wherein said electronic wallet holds an electronic credit card and employs said electronic credit card to purchase said electronic payment card, said electronic telephone card or said electronic ticket.

23. A mobile electronic commerce system according to claim 12, wherein said electronic wallet includes a plurality of kinds of wireless communication means as said plurality of types of communication means.

24. A mobile electronic commerce system according to claim 23, wherein, as means for engaging in wireless communication with said electronic payment card settlement means or said electronic ticket examination means, said electronic wallet includes wireless communication means that has a shorter communication distance and a higher directivity than has the wireless communication means employed for said electronic telephone card settlement or for said service providing means.

25. A mobile electronic commerce system according to claim 24, wherein, as means for engaging in wireless communication with said electronic payment card settlement means or said electronic ticket examination means, said electronic wallet includes optical communication means and radio communication means for engaging in wireless communication with said electronic telephone card settlement means or said service providing means.

26. A mobile electronic commerce system according to claim 10, wherein said electronic payment card settlement means includes wireless communication means for engaging in communication with said service providing means.

27. A mobile electronic commerce system according to claim 10, wherein said electronic payment card settlement means is an automatic vending machine that includes automatic product or service providing means.

28. A mobile electronic commerce system according to claim 9, wherein said electronic wallet comprises:

input means for entering a numerical value and for performing a selection operation;
a central processing unit for generating data to be transmitted via said wireless communication means, and for processing data received via said wireless communication means;
first storage means for storing a control program for controlling an operation performed by said central processing unit;
display means for displaying data processed by said central processing unit; and
second storage means for storing said data processed by said central processing unit,
wherein said electronic ticket, said electronic payment card or said electronic telephone card is stored in said second storage means.

29. A mobile electronic commerce system according to claim 10, wherein said electronic payment card settlement means includes:

optical communication means for communicating with said electronic wallet;
communication means for communicating with said service providing means;
input means for entering a numerical value and performing a selection operation;
a central processing unit for generating data to be transmitted via said optical communication means and said communication means, and for processing data received via said optical communication means and said communication means;
first storage means for storing a control program for controlling an operation performed by said central processing unit;
display means for displaying data processed by said central processing unit; and
second storage means for storing said data processed by said central processing unit,
wherein a settlement process program module for said electronic payment card is stored in said second storage means.

30. A mobile electronic commerce system according to claim 10, wherein said electronic payment card settlement means comprises:

optical communication means for communicating with said electronic wallet;
radio communication means for communicating with said service providing means;
product identification means for identifying a product type;
input means for entering a numerical value and for performing a selection operation;
a central processing unit for calculating a charge for said product, for generating data to be transmitted via said optical communication means and said radio communication means, and for processing data received via said optical communication means and said radio communication means;
first storage means for storing a control program for controlling an operation performed by said central processing unit;
display means for displaying data processed by said central processing unit;
second storage means for storing said data processed by said central processing unit; and
third storage means for storing value information for said product,
wherein a settlement process program module for said electronic payment card is stored in said second storage means.

31. A mobile electronic commerce system according to claim 27, wherein said automatic vending machine comprises:

optical communication means for communicating with said electronic wallet;
radio communication means for communicating with said service providing means;
selection means for selecting a product to be purchased or a service;
automatic providing means for providing said product or said service;
a central processing unit for generating data to be transmitted via said optical communication means and said radio communication means, and for processing data received via said optical communication means and said radio communication means;
first storage means for storing a control program for controlling an operation performed by said central processing unit;
display means for displaying data processed by said central processing unit;
second storage means for storing said data processed by said central processing unit;
third storage means for storing value information and stock information for said product; and
fourth storage means for storing promotion information for said product or for said service,
wherein a settlement process program module for said electronic payment card is stored in said second storage means.

32. A mobile electronic commerce system according to claim 14 or 21, wherein said electronic telephone card settlement means comprises:

radio communication means for communicating with said electronic wallet;
communication means for communicating with said service providing means;
communication line exchange means for exchanging a plurality of communication lines;
a central processing unit for generating data to be transmitted via said radio communication means and said communication means, and for processing data received via said radio communication means and said communication means;
first storage means for storing a control program for controlling an operation performed by said central processing unit; and
second storage means for storing said data processed by said central processing unit,
wherein a settlement process program module for said electronic telephone card is stored in said second storage means.

33. A mobile electronic commerce system according to claim 17, wherein said electronic ticket examination means comprises:

optical communication means for communicating with said electronic wallet;
communication means for communicating with said service providing means;
input means for entering a numerical value and for performing a selection operation;
a central processing unit for generating data to be transmitted via said optical communication means and said communication means, and for processing data received via said optical communication means and said communication means;
first storage means for storing a control program for controlling an operation performed by said central processing unit;
display means for displaying data processed by said central processing unit; and
second storage means for storing said data processed by said central processing unit,
wherein an examination program module for said electronic ticket is stored in said second storage means.

34. A mobile electronic commerce system according to claim 21, wherein said service providing means comprises:

user information storage means for storing information concerning said electronic wallet and information concerning a settlement contract concluded with an owner of said electronic wallet;
merchant information storage means for storing information concerning said electronic payment card
settlement means, said electronic telephone card settlement means and said electronic ticket examination

means, and information concerning a settlement contracts concluded with owners of electronic payment cards, electronic telephone cards and electronic tickets;
settlement processor information storage means for storing information concerning said settlement processing means;
payment card issuer information storage means for storing information concerning said payment card issuing means, and information concerning a settlement contract concluded with an owner of said payment card issuing means;
telephone card issuer information storage means for storing information concerning said telephone card issuing means, and information concerning a settlement contract concluded with an owner of said telephone card issuing means;
ticket issuer information storage means for storing information concerning said ticket issuing means, and information concerning a settlement contract concluded with an owner of said ticket issuing means;
service director information storage means for storing list information for said electronic wallet, said electronic payment card settlement means, said electronic telephone card settlement means, said electronic ticket examination means, said settlement processing means, said payment card issuing means, said telephone card issuing means and said ticket issuing means, and information concerning said electronic ticket, said electronic payment card and said electronic telephone card; and
a computer system for processing data in a service provision process for selling, issuing and managing said electronic ticket, said electronic payment card and said electronic telephone card.

35. A mobile electronic commerce system according to claim 11, wherein said settlement processing means comprises:

communication means for communicating with said service providing means;
subscriber information storage means for storing information concerning a settlement contract concluded with an owner of said electronic wallet;
member shop information storage means for storing information concerning settlement contracts concluded with owners of electronic payment card settlement means, electronic telephone card settlement means, electronic ticket examination means, payment card issuing means, telephone card issuing means, and ticket issuing means; and
a computer system for processing data employed in a settlement process.

36. A mobile electronic commerce system according to claim 11, wherein said payment card issuing means comprises:

communication means for communicating with said service providing means;
customer information storage means for storing information concerning the purchase history of a customer;
payment card issuance information storage means for storing information concerning a payment card that has been issued;
payment card information storage means for storing information concerning the stock of payment cards;
and
a computer system for processing data during a payment card issuing transaction process.

37. A mobile electronic commerce system according to claim 15, wherein said telephone card issuing means comprises:

communication means for communicating with said service providing means;
customer information storage means for storing information concerning the purchase history of a customer;
telephone card issuance information storage means for storing information concerning a telephone card that has been issued;
telephone card information storage means for storing information concerning the stock of telephone cards;
and
a computer system for processing data concerning a telephone card issuing transaction process.

38. A mobile electronic commerce system according to claim 19, wherein said ticket issuing means comprises:

communication means for communicating with said service providing means;
customer information storage means for storing information concerning the purchase history of a customer;
ticket issuance information storage means for storing information concerning a ticket that has been issued;
ticket information storage means for storing information concerning the stock of tickets; and
a computer system for processing data concerning a ticket issuing transaction process.

39. A mobile electronic commerce system according to claim 11, wherein said electronic wallet generates and then transmits, to said service providing means, a payment card application message for the purchase of an electronic payment card; wherein said service providing means, upon receiving said payment card application message, communicates with said payment card issuing means and receives therefrom an electronic payment card issuance request message requesting that said service providing means perform an electronic payment card issuing process and an electronic payment card charge settlement process; wherein said service providing means, upon receiving said request message, communicates with said settlement processing means to perform the settlement process for the charge for said payment card, generates an electronic payment card from payment card information that is generated by said payment card issuing means and is included in said electronic payment card issuance request message, and transmits said electronic payment card to said electronic wallet; and wherein said electronic wallet, upon receiving said electronic payment card, stores said electronic payment card in said second storage means thereof.

40. A mobile electronic commerce system according to claim 28, wherein a micro-check message, generated by an electronic payment card stored in said second storage means, is transmitted to said electronic payment card settlement means in order to confirm the submission of a payment that is the equivalent of an amount entered by said input means.

41. A mobile electronic commerce system according to claim 40, wherein said electronic payment card settlement means, upon receiving said micro-check message, generates and then transmits, to said electronic wallet, said reception message to acknowledge that said micro-check message has been received.

42. A mobile electronic commerce system according to claim 15, wherein said electronic wallet generates and then transmits, to said service providing means, a telephone card application message requesting the purchase of an electronic telephone card; wherein said service providing means, upon receiving said telephone card application message, communicates with said telephone card issuing means and receives therefrom an electronic telephone card issuance request message indicating said service providing means has been requested to perform an electronic telephone card issuing process and an electronic telephone card charge settlement process; wherein said service providing means, upon receiving said request message, communicates with said settlement processing means to perform the settlement for the charge for said telephone card, generates an electronic telephone card using telephone card information that is generated by said telephone card issuing means and is included in said electronic telephone card issuance request message, and transmits said electronic telephone card to said electronic wallet; and wherein said electronic wallet, upon receiving said electronic telephone card, stores said electronic telephone card in said second storage means thereof.

43. A mobile electronic commerce system according to claim 28, wherein a telephone micro-check message is generated by an electronic telephone card stored in said second storage means and is transmitted to said electronic telephone card settlement means in order to confirm the submission of a payment that is equivalent to an amount charged by said electronic telephone settlement means.

44. A mobile electronic commerce system according to claim 43, wherein said electronic telephone card settlement means, upon receiving said telephone micro-check message, generates and then transmits, to said electronic wallet, a receipt message acknowledging that said telephone micro-check message has been received.

45. A mobile electronic commerce system according to claim 19, wherein said electronic wallet generates and then transmits, to said service providing means, a ticket application message requesting the purchase of an electronic ticket; wherein said service providing means, upon receiving said ticket application message, communicates with said ticket issuing means, and receives therefrom an electronic ticket issuance request message that indicates said service providing means has been requested to perform an electronic ticket issuing process and an electronic ticket charge settlement process; wherein said service

providing means, upon receiving said request message, communicates with said settlement processing means to perform the settlement of the charge for said ticket, generates an electronic ticket from ticket information that is generated by said ticket issuing means and is included in said electronic ticket issuance request message, and transmits said electronic ticket to said electronic wallet; and wherein said electronic wallet, upon receiving said electronic ticket stores said electronic ticket in said second storage means thereof.

46. A mobile electronic commerce system according to claim 28, wherein said electronic wallet generates a ticket presenting message that describes the contents of said electronic ticket stored in said second storage means, and transmits said ticket presenting message to said electronic ticket examination means.

47. A mobile electronic commerce system according to claim 28, wherein said electronic wallet, upon receiving a command message from said electronic ticket examination means, changes said electronic ticket to a post-examined state, and generates and then transmits, to said electronic ticket examination means, a ticket examination response message that describes the contents of said electronic ticket that has been changed.

48. A mobile electronic commerce system according to claim 47, wherein said electronic ticket examination means, upon receiving said ticket examination response message, generates and then transmits, to said electronic wallet, an examination certificate message that verifies said electronic ticket has been examined.

49. A mobile electronic commerce system according to claim 28, wherein a first electronic wallet generates a payment card transfer certificate message verifying that said electronic payment card stored in said second storage means is to be transferred to a second electronic wallet, and transmits said payment card transfer certificate message via wireless communication means to said second electronic wallet; wherein said second electronic wallet transmits, to said service providing means, said payment card transfer certificate message that is received; wherein said service providing means performs an examination to establish the validity of said payment card transfer certificate message that is received, and transmits, to said second electronic wallet, the electronic payment card that is described in said payment card transfer certificate message; and wherein said second electronic wallet stores, in said second storage means thereof, said electronic payment card that is received.

50. A mobile electronic commerce system according to claim 49, wherein said second electronic wallet, upon receiving said payment card transfer certificate message, generates a payment card receipt message confirming that said payment card transfer certificate message has been received, and transmits said payment card receipt message via said wireless communication means to said first electronic wallet; and wherein said first electronic wallet, upon receiving said payment card receipt message, deletes said electronic payment card stored in said second storage means thereof.

51. A mobile electronic commerce system according to claim 28, wherein a first electronic wallet generates a telephone card transfer certificate message confirming that said electronic telephone card stored in said second storage means is to be transferred to a second electronic wallet, and transmits said telephone card transfer certificate message via wireless communication means to said second electronic wallet; wherein said second electronic wallet transmits, to said service providing means, said telephone card transfer certificate message that is received; wherein said service providing means performs an examination to establish the validity of said telephone card transfer certificate message that is received, and transmits, to said second electronic wallet, the electronic telephone card that is described in said telephone card transfer certificate message; and wherein said second electronic wallet stores, in said second storage means thereof, said electronic telephone card that is received.

52. A mobile electronic commerce system according to claim 28, wherein said second electronic wallet, upon receiving said telephone card transfer certificate message, generates a telephone card receipt message confirming that said telephone card transfer certificate message has been received, and transmits said telephone card receipt message via said wireless communication means to said first electronic wallet; and wherein said first electronic wallet, upon receiving said telephone card receipt message, deletes said electronic telephone card stored in said second storage means thereof.

53. A mobile electronic commerce system according to claim 28, wherein a first electronic wallet generates a ticket transfer certificate message confirming that said electronic ticket stored in said second storage means is to be transferred to a second electronic wallet, and transmits said ticket transfer certificate message via wireless communication means to said second electronic wallet; wherein said second

electronic wallet transmits, to said service providing means, said ticket transfer certificate message that is received; wherein said service providing means performs an examination to establish the validity of said ticket transfer certificate message that is received, and transmits, to said second electronic wallet, an electronic ticket that is described in said ticket transfer certificate message; and wherein said second electronic wallet stores, in said second storage means thereof, said electronic ticket that is received.

54. A mobile electronic commerce system according to claim 53, wherein said second electronic wallet, upon receiving said ticket transfer certificate message, generates a ticket receipt message confirming that said ticket transfer certificate message has been received, and transmits said ticket receipt message via said wireless communication means to said first electronic wallet; and wherein said first electronic wallet, upon receiving said ticket receipt message, deletes said electronic ticket stored in said second storage means thereof.

55. A mobile electronic commerce system according to claim 11, wherein said electronic wallet generates and then transmits, to said service providing means, an electronic payment card installation request message requesting the installation of an electronic payment card; wherein said service providing means, upon receiving said payment card installation request message, communicates with said payment card issuing means and receives therefrom an electronic payment card installation request message indicating that said service providing means is requested to install an electronic payment card; wherein said service providing means, upon receiving said request message, generates an electronic payment card using payment card information that is generated by said payment card issuing means and is included in said electronic payment card installation request message, and transmits said electronic payment card to said electronic wallet; and wherein said electronic wallet, upon receiving said electronic payment card stores said electronic payment card in said second storage means thereof.

56. A mobile electronic commerce system according to claim 55, wherein said electronic payment card installation request message includes electronic payment card installation information that is entered by input means for said electronic wallet and that uniquely describes an electronic payment card that is to be installed.

57. A mobile electronic commerce system according to claim 15, wherein said electronic wallet generates and then transmits, to said service providing means, an electronic telephone card installation request message for requesting the installation of an electronic telephone card; wherein said service providing means, upon receiving said telephone card installation request message, communicates with said telephone card issuing means, and receives therefrom an electronic telephone card installation request message indicating that said service providing means is to install an electronic telephone card; wherein said service providing means, upon receiving said request message, generates an electronic telephone card using telephone card information that is generated by said telephone card issuing means and that is included in said electronic telephone card installation request message, and transmits said electronic telephone card to said electronic wallet; and wherein said electronic wallet, upon receiving said electronic telephone card, stores said electronic telephone card in said second storage means thereof.

58. A mobile electronic commerce system according to claim 57, wherein said electronic telephone card installation request message includes said electronic telephone card installation information that is entered by input means for said electronic wallet and that uniquely describes an electronic telephone card that is to be installed.

59. A mobile electronic commerce system according to claim 19, wherein said electronic wallet generates and then transmits, to said service providing means, an electronic ticket installation request message requesting the installation of an electronic ticket; wherein said service providing means, upon receiving said ticket installation request message, communicates with said ticket issuing means, and receives therefrom an electronic ticket installation request message indicating that said service providing means is to install an electronic ticket; wherein said service providing means, upon receiving said request message, generates an electronic ticket using ticket information that is generated by said ticket issuing means and is included in said electronic ticket installation request message, and transmits said electronic ticket to said electronic wallet; and wherein said electronic wallet, upon receiving said electronic ticket, stores said electronic ticket in said second storage means thereof.

60. A mobile electronic commerce system according to claim 59, wherein said electronic ticket installation request message includes said electronic ticket installation information that is entered by input means for said electronic wallet and that uniquely describes an electronic ticket that is to be installed.

61. A mobile electronic commerce system according to claim 55, wherein said electronic payment card installation information, said electronic telephone card installation information or said electronic ticket installation information consists of first identification information describing a type of electronic payment card, a type of electronic telephone card or a type of electronic ticket, and second identification information that uniquely describes an electronic payment card, an electronic telephone card or an electronic ticket, of a type described using said first identification information, that is to be installed; and wherein said second identification information is information generated at random.

62. A mobile electronic commerce system according to claim 61, wherein said first identification information and said second identification information are represented by 8-digit numerals and 32-digit numerals.

63. A mobile electronic commerce system according to claim 55, wherein an object whereon or wherein said electronic payment card installation information, said electronic telephone installation information or said electronic ticket installation information is printed or engraved is employed as sales distribution means or transfer means for said electronic payment card, said electronic telephone card or said electronic ticket.

64. A mobile electronic commerce system according to claim 55, wherein a recording medium on which said electronic payment card installation information, said electronic telephone installation information or said electronic ticket installation information is stored is employed as sales distribution means or transfer means for an electronic payment card, an electronic telephone card or an electronic ticket.

65. A mobile electronic commerce system according to claim 28, wherein said service providing means generates and then transmits, to said electronic wallet, a modification command message for the modification of the contents of said electronic ticket; and said electronic wallet, upon receiving said modification command message, updates said electronic ticket stored in said second storage means to provide a new electronic ticket as is described in said modification command message.

66. A mobile electronic commerce system according to claim 28, wherein said service providing means generates and then transmits, to said electronic wallet, a modification notification message for the modification of the contents of said electronic ticket; wherein said electronic wallet, upon receiving said modification notification message, generates and then transmits, to said service providing means, a reaction selection message acknowledging receipt of the message for the modification of said contents of said electronic ticket; wherein said service providing means, upon receiving said reaction selection message, generates and then transmits, to said electronic wallet, a modification command message instructing the modification of said contents of said electronic ticket; and wherein said electronic wallet, upon receiving said modification command message, updates said electronic ticket stored in said second storage means to provide a new electronic ticket that is described in said modification command message.

67. A mobile electronic commerce system according to claim 28, wherein said service providing means generates and then transmits, to said electronic wallet, a modification notification message for the modification of the contents of said electronic ticket; wherein said electronic wallet, upon receiving said modification notification message, generates and then transmits, to said service providing means, a reaction selection message requesting a refund for said electronic ticket; wherein said service providing means, upon receiving said reaction selection message, communicates with said settlement processing means to issue a refund for said electronic ticket, and generates and then transmits, to said electronic wallet, a refund receipt message indicating that a refund process has been completed; and wherein said electronic wallet, upon receiving said refund receipt message, deletes said electronic ticket from said second storage means.

68. A mobile electronic commerce system according to claim 21, wherein a computer system in said service providing means comprises:

user information processing means for communicating with said electronic wallet and for processing information stored in user information storage means;
 merchant information processing means for communicating with said electronic payment card settlement means, said electronic telephone card settlement means or said electronic ticket examination means, and for processing information stored in merchant information storage means;
 settlement processor information processing means for communicating with said electronic settlement processing means, and for processing information stored in settlement processor information storage means;

payment card issuer information processing means for communicating with said payment card issuing means, and for processing information stored in payment card issuer information storage means; telephone card issuer information processing means for communicating with said telephone card issuing means, and for processing information stored in telephone card issuer information storage means; ticket issuer information processing means for communicating with said ticket issuing means, and for processing information stored in ticket issuer information storage means; service director information processing means for communicating with said user information processing means, said merchant information processing means, said settlement processor information processing means, said payment card issuer information processing means, said telephone card issuer information processing means and said ticket issuer information processing means, and for interacting with those means while processing data during a service providing process; and service manager information processing means for controlling the generation and the deletion of said user information processing means, said merchant information processing means, said settlement processor information processing means, said payment card issuer information processing means, said telephone card issuer information processing means, said ticket issuer information processing means and said service director information processing means.

69. A mobile electronic commerce system according to claim 34, wherein said electronic wallet generates and then transmits, to said service providing means, a payment card registration request message requesting that said service providing means register, as an electronic payment card that is to be used by the owner of said electronic wallet, an electronic payment card that is stored in said second storage means; and wherein said service providing means, upon receiving said payment card registration request message, registers said electronic payment card for use in said service director information storage means.

70. A mobile electronic commerce system according to claim 69, wherein said service providing means, upon receiving said payment card registration request message, generates and then transmits, to said electronic wallet, a registered card certificate confirming that said electronic payment card has been registered for use; and wherein said electronic wallet stores, in said second storage means, said registered card certificate that is received and changes the state of said electronic payment card to the usable state.

71. A mobile electronic commerce system according to claim 34, wherein said electronic wallet generates and then transmits, to said service providing means, a telephone card registration request message requesting that service providing means register, as an electronic telephone card that is to be used by the owner of said electronic wallet, an electronic telephone card that is stored in said second storage means; and wherein said service providing means, upon receiving said telephone card registration request message, registers said electronic telephone card for use in said service director information storage means.

72. A mobile electronic commerce system according to claim 71, wherein said service providing means, upon receiving said telephone card registration request message, generates and then transmits, to said electronic wallet, a registered card certificate confirming that said electronic telephone card has been registered for use; and wherein said electronic wallet stores, in said second storage means, said registered card certificate that is received and changes the state of said electronic telephone card to the usable state.

73. A mobile electronic commerce system according to claim 34, wherein said electronic wallet generates and then transmits, to said service providing means, a ticket registration request message requesting that said second storage means register, as an electronic ticket that is to be used by the owner of said electronic wallet, an electronic ticket that is stored in said second storage means; and wherein said service providing means, upon receiving said ticket registration request message, registers said electronic ticket for use in said service director information storage means.

74. A mobile electronic commerce system according to claim 73, wherein said service providing means, upon receiving said ticket registration request message, generates and then transmits, to said electronic wallet, a registered ticket certificate that verifies said electronic ticket has been registered for use; and wherein said electronic wallet stores, in said second storage means, said registered ticket certificate that is received, and changes the state of said electronic ticket to the usable state.

75. A mobile electronic commerce system according to claim 28, wherein said electronic payment card comprises:

a payment card program;
presented card information describing the contents of said electronic payment card when issued; and
a card certificate indicating that said electronic payment card is authentic. Said payment card program includes:
electronic payment card state management information; and
payment card program data for specifying an operation to be performed by said electronic payment card.
The digital signature of the owner of said service providing means is provided for said presented card information.

76. A mobile electronic commerce system according to claim 75, wherein said payment card program includes a card signature private key that is employed for a digital signature provided for said electronic payment card, and wherein said card certificate is a public key certificate verifying that a card signature public key that is paired with said card signature private key is authentic.

77. A mobile electronic commerce system according to claim 75, wherein a settlement program module for said electronic payment card includes two cryptographic keys, an accounting device authentication private key and a card authentication public key, and wherein said payment card program includes an accounting device authentication public key, which is paired with said accounting device authentication private key, and a card authentication private key, which is paired with said card authentication public key.

78. A mobile electronic commerce system according to claim 75, wherein said payment card program data includes:

a transaction module program for specifying the procedures to be used for message data that are exchanged by said electronic wallet and said electronic payment card settlement means;
a display module program for specifying the manner in which said electronic payment card is to be displayed; and
representative component information for said electronic payment card,
wherein a central processing unit in said electronic wallet processes, in accordance with said transaction module program for said electronic payment card, said message data that are exchanged with said electronic payment card settlement means, and displays said representative component information in accordance with said display module program of said electronic payment card, so that on display means said electronic payment card is displayed in said electronic wallet.

79. A mobile electronic commerce system according to claim 34, wherein a template program that constitutes a model for said electronic payment card is stored in said payment card issuer information storage means for said service providing means.

80. A mobile electronic commerce system according to claim 79, wherein said template program for said electronic payment card includes:

a transaction module program for said electronic payment card;
a display module program; and
representative component information.
Therefore, various types of electronic payment cards can be safely issued.

81. A mobile electronic commerce system according to claim 28, wherein said electronic telephone card comprises:

a telephone card program;
presented card information describing the contents of said electronic telephone card when issued; and
a card certificate indicating that said electronic telephone card is authentic,
wherein said telephone card program includes:
electronic telephone card state management information; and
telephone card program data for specifying an operation to be performed by said electronic telephone card,
and
wherein the digital signature of the owner of said service providing means is provided for said presented card information.

82. A mobile electronic commerce system according to claim 81, wherein said telephone card program includes a card signature private key that is employed for a digital signature provided for said electronic telephone card, and wherein said card certificate is a public key certificate verifying that a card signature public key that is paired with said card signature private key is authentic.

83. A mobile electronic commerce system according to claim 81, wherein a settlement program module for said electronic telephone card includes two cryptographic keys, an accounting device authentication private key and a card authentication public key, and wherein said telephone card program includes an accounting device authentication public key, which is paired with said accounting device authentication private key, and a card authentication private key, which is paired with said card authentication public key.

84. A mobile electronic commerce system according to claim 81, wherein said telephone card program data includes:

a transaction module program for specifying the procedures to be used for message data that are exchanged by said electronic wallet and said electronic telephone card settlement means;
a display module program for specifying the manner in which said electronic telephone card is to be displayed; and
representative component information for said electronic telephone card, and
wherein a central processing unit in said electronic wallet processes, in accordance with said transaction module program for said electronic telephone card, said message data that are exchanged with said electronic telephone card settlement means, and displays said representative component information in accordance with said display module program for said electronic telephone card, so that on display means said electronic telephone card is displayed in said electronic wallet.

85. A mobile electronic commerce system according to claim 34, wherein a template program that constitutes a model for said electronic telephone card is stored in said telephone card issuer information storage means for said service providing means.

86. A mobile electronic commerce system according to claim 85, wherein said template program for said electronic telephone card includes:

a transaction module program for said electronic telephone card;
a display module program; and
representative component information.

87. A mobile electronic commerce system according to claim 28, wherein said electronic ticket comprises:

a ticket program;
presented ticket information describing the contents of said electronic ticket when issued; and
a ticket certificate indicating that said electronic ticket is authentic,
wherein said ticket program includes:
electronic ticket state management information; and
ticket program data for specifying an operation to be performed by said electronic ticket, and
wherein the digital signature of the owner of said service providing means is provided for said presented ticket information.

88. A mobile electronic commerce system according to claim 87, wherein said ticket program includes a ticket signature private key that is employed for a digital signature provided for said electronic ticket, and wherein said ticket certificate is a public key certificate verifying that a ticket signature public key that is paired with said ticket signature private key is authentic.

89. A mobile electronic commerce system according to claim 87, wherein an examination program module for said electronic ticket includes two cryptographic keys, a gate authentication private key and a ticket authentication public key, and wherein said ticket card program includes a gate authentication public key, which is paired with said gate authentication private key, and a ticket authentication private key, which is paired with said ticket authentication public key.

90. A mobile electronic commerce system according to claim 87, wherein said ticket program data includes:

a transaction module program for specifying the procedures to be used for message data that are exchanged by said electronic wallet and said electronic ticket examination means;
a display module program for specifying the manner in which said electronic ticket is to be displayed; and
representative component information for said electronic ticket, and
wherein a central processing unit in said electronic wallet processes, in accordance with said transaction module program for said electronic ticket, said message data that are exchanged with said electronic ticket examination means, and displays said representative component information in accordance with said display module program for said electronic ticket, so that on display means said electronic ticket is displayed in said electronic wallet.

91. A mobile electronic commerce system according to claim 34, wherein a template program that constitutes a model for said electronic ticket is stored in said ticket issuer information storage means for said service providing means.

92. A mobile electronic commerce system according to claim 91, wherein said template program for said electronic ticket includes:

a transaction module program for said electronic ticket;
a display module program; and
representative component information.

93. A mobile electronic commerce system according to claim 39, wherein identification information that describes a payment method selected by said input means for said electronic wallet is included in said payment card application message issued by said electronic wallet when requesting the purchase of an electronic payment card.

94. A mobile electronic commerce system according to claim 79, wherein said electronic payment card issuance request message or said electronic payment card installation request message includes template program identification information for designating, in the order to be used for the generation of an electronic payment card, one of a plurality of template programs that are stored in said payment card issuer information storage means.

95. A mobile electronic commerce system according to claim 78, wherein said electronic payment card issuance request message or said electronic payment card installation request message includes representative component information describing the representative component information to be used for an electronic payment card that is to be generated.

96. A mobile electronic commerce system according to claim 76, wherein said electronic wallet generates and then transmits, to said service providing means, a payment card registration request message requesting that said service providing means register, as an electronic payment card that is to be used by the owner of said electronic wallet, said electronic payment card stored in said second storage means for said electronic wallet; wherein said service providing means, upon receiving said payment card registration request message, newly generates, for said electronic payment card, a card signature private key, a card signature public key and a registered card certificate for authenticating said card signature public key, registers said electronic payment card for use in said service director information storage means, and then transmits, to said electronic wallet, said card signature private key and said registered card certificate; and wherein said electronic wallet updates said card signature private key and said registered card certificate that are in storage by replacing them with those that have newly been received, and changes said state management information for said electronic payment card to a usable state.

97. A mobile electronic commerce system according to claim 28, wherein said electronic wallet employs an electronic payment card, which is selected by input means for said electronic wallet from among those stored in said second storage means, to generate a micro-check message that verifies a payment corresponding to an amount entered by said input means, and transmits said micro-check message to said electronic payment card settlement means.

98. A mobile electronic commerce system according to claim 28, wherein said electronic wallet employs an electronic payment card, which is selected by input means of said electronic wallet from among those stored in said second storage means, to generate a payment offer message that offers a payment corresponding to an amount entered by said input means, and transmits said payment offer message to said electronic payment card settlement means; wherein said electronic payment card settlement means, upon receiving said payment offer message, generates and then transmits, to said electronic wallet, a payment offer response message that assesses a charge corresponding to an amount entered by input means for said electronic payment card settlement means; wherein said electronic wallet, upon receiving said payment offer response message and if said assessed charge is equal to or smaller than an amount entered by said input means for said electronic wallet, subtracts said assessed charge from a remaining amount stored on said electronic payment card, and generates and then transmits, to said electronic payment card settlement means, a micro-check message validating a payment corresponding to said assessed charge; wherein said electronic payment card settlement means stores said received micro-check message in said second storage means for said electronic payment card settlement means, and generates and then transmits, to said electronic wallet, a receipt message confirming that said micro-check message has been received; and wherein said electronic wallet stores said received receipt message in said second storage means for said electronic wallet.

99. A mobile electronic commerce system according to claim 28, wherein said payment offer message includes:

a payment amount entered by said input means of said electronic wallet;
presented card information and a registered card certificate for said electronic payment card; and
state management information to which a digital signature has been added using said card signature private key.

100. A mobile electronic commerce system according to claim 76, wherein said micro-check message includes:

a payment amount;
an amount remaining stored on said electronic payment card;
identification information for said electronic payment card settlement means; and
identification information for the owner of said electronic payment card settlement means. Further, a digital signature is provided for said micro-check message by using said card signature private key for said electronic payment card.

101. A mobile electronic commerce system according to claim 100, wherein the digital signature of the owner of said electronic wallet is also provided for said micro-check message.

102. A mobile electronic commerce system according to claim 40, wherein said micro-check message includes a micro-check issuing number representing the order in which micro-check messages are generated by said electronic payment card.

103. A mobile electronic commerce system according to claim 98, wherein, at a time designated by said service providing means, said electronic payment card settlement means generates an upload data message that includes data stored in said second storage means for said electronic payment card settlement means, and then transmits said upload data message to said service providing means; wherein said service providing means, upon receiving said upload data message, examines the validity of a micro-check that is included in said upload data message by comparing said micro-check with registration information for said electronic payment card that is registered in said service director information storage means, and generates and then transmits, to said electronic payment card settlement means, an update data message that includes update data for said second storage means for said electronic payment card settlement means; and wherein said electronic payment card settlement means extracts said update data from said update data message that is received, and updates data stored in said second storage means.

104. A mobile electronic commerce system according to claim 28, wherein a first electronic wallet generates a payment card transfer offer message containing an offer to transfer, to a second electronic wallet, an electronic payment card that is stored in said second storage means, and then transmits said

payment card transfer offer message, via said wireless communication means, to said second electronic wallet; wherein said second electronic wallet, upon receiving said payment card transfer offer message, generates a payment card transfer offer response message indicating that the contents of said payment card transfer offer message are accepted, and then transmits said payment card transfer offer response message, via said wireless communication means, to said first electronic wallet; and wherein said first electronic wallet, upon receiving said payment card transfer offer response message, generates and then transmits, to said second electronic wallet, a payment card transfer certificate message confirming the transfer of said electronic payment card to said second electronic wallet.

105. A mobile electronic commerce system according to claim 104, wherein said payment card transfer offer message includes:

presented card information, and a card certificate or a registered card certificate for said electronic payment card; and
state management information having an added digital signature prepared using a card signature private key.

106. A mobile electronic commerce system according to claim 104, wherein said payment card transfer offer message includes a public key certificate for the owner of said first electronic wallet; wherein a digital signature of said owner of said first electronic wallet is provided for said payment card transfer offer message; wherein said payment card transfer offer response message includes a public key certificate for the owner of said second electronic wallet; wherein a digital signature of said owner of said second electronic wallet is provided for said payment card transfer offer message; wherein said payment card transfer certificate message includes identification information for said public key certificate of said owner of said first electronic wallet and identification information for said public key certificate of said owner of said second electronic wallet; and wherein a digital signature using a card signature private key for said electronic payment card and a digital signature of said owner of said first electronic wallet are provided for said payment card transfer certificate message.

107. A mobile electronic commerce system according to claim 42, wherein identification information that describes a payment method selected by said input means of said electronic wallet is included in said telephone card application message issued by said electronic wallet when requesting the purchase of an electronic telephone card.

108. A mobile electronic commerce system according to claim 85, wherein said electronic telephone card issuance request message or said electronic telephone card installation request message includes template program identification information for designating, following the order that is to be used for the generation of electronic telephone cards, one of a plurality of template programs that are stored in said telephone card issuer information storage means.

109. A mobile electronic commerce system according to claim 84, wherein said electronic telephone card issuance request message or said electronic telephone card installation request message includes representative component information describing representative component information to be used for an electronic telephone card that is to be generated.

110. A mobile electronic commerce system according to claim 82, wherein said electronic wallet generates and then transmits, to said service providing means, a telephone card registration request message requesting that said service providing means register, as an electronic telephone card that is to be used by the owner of said electronic wallet, said electronic telephone card stored in said second storage means for said electronic wallet; wherein said service providing means, upon receiving said telephone card registration request message, newly generates, for said electronic telephone card, a card signature private key, a card signature public key and a registered card certificate for confirming said card signature public key, registers for use said electronic telephone card in said service director information storage means, and then transmits, to said electronic wallet, said card signature private key and said registered card certificate; and wherein said electronic wallet updates said card signature private key and said registered card certificate that are in storage by replacing them with those that have newly been received, and changes said state management information for said electronic telephone card to a usable state.

111. A mobile electronic commerce system according to claim 28, wherein said electronic wallet employs an electronic telephone card, which is selected by input means for said electronic wallet from among those

stored in said second storage means, to generate a micro-check message verifying a payment corresponding to an amount entered by said input means, and transmits said micro-check message to said electronic telephone card settlement means.

112. A mobile electronic commerce system according to claim 28, wherein said electronic wallet employs an electronic telephone card, which is selected by input means for said electronic wallet from among those stored in said second storage means, to generate a micro-check call request message requesting a radio communication service in order to communicate with a side that is designated by said input means, and transmits said micro-check call request message to said electronic telephone card settlement means; wherein said electronic telephone card settlement means, upon receiving said micro-check call request message, generates and then transmits, to said electronic wallet, a micro-check call response message for an amount charged that corresponds to a communication fee; said electronic wallet, upon receiving said micro-check call response message, subtracts the amount charged from the remaining amount stored on said electronic telephone card, and generates and then transmits, to said electronic telephone card settlement means, a telephone micro-check message verifying the payment of an amount corresponding to said amount charged; wherein said electronic telephone card settlement means, upon receiving said telephone micro-check message, generates and then transmits, to said electronic wallet, a receipt message confirming the receipt of said telephone micro-check message; and wherein said electronic wallet stores said received receipt message in said second storage means for said electronic wallet.

113. A mobile electronic commerce system according to claim 28, wherein said electronic telephone card settlement means, when radio wireless communication service is provided, generates and then transmits, to said electronic wallet, a communication fee charge message for an amount charged that corresponds to an additional communication fee; wherein said electronic wallet, upon receiving said communication fee charge message, subtracts said amount that is charged from an amount remaining on said electronic telephone card, and generates and then transmits, to said electronic telephone card settlement means, a new telephone micro-check message verifying payment of the total amount charged; wherein said electronic telephone card settlement means generates and then transmits, to said electronic wallet, a receipt message confirming that said telephone micro-check message has been received; wherein said electronic wallet updates a receipt message stored in said second storage means for said electronic wallet by storing therein said receipt message that is newly received; and wherein said electronic telephone card settlement means, when provision of said radio wireless communication service is terminated, stores the latest telephone micro-check message in said second storage means for said electronic telephone card settlement means.

114. A mobile electronic commerce system according to claim 112 or 113, wherein said micro-check call request message includes:

identification information for said side that is designated by said input means of said electronic wallet; presented card information and a registered card certificate for said electronic telephone card; and state management information accompanied by a digital signature that is provided by using a card signature private key.

115. A mobile electronic commerce system according to claim 82, wherein said telephone micro-check message includes:

a payment amount;
a amount remaining stored on said electronic telephone card;
identification information for said electronic telephone card settlement means; and
identification information for the owner of said electronic telephone card settlement means, and
wherein a digital signature is provided for said telephone micro-check message by using said card signature private key of said electronic telephone card.

116. A mobile electronic commerce system according to claim 115, wherein not only said digital signature using said card signature private key for said electronic telephone card, but also the digital signature of the owner of said electronic wallet is provided for said telephone micro-check message.

117. A mobile electronic commerce system according to claim 43, wherein said telephone micro-check message includes a telephone micro-check issuing number representing the order in which telephone

micro-check messages are generated by said electronic telephone card.

118. A mobile electronic commerce system according to claim 113, wherein, at a time designated by said service providing means, said electronic telephone card settlement means generates an upload data message that includes data stored in said second storage means for said electronic telephone card settlement means, and then transmits said upload data message to said service providing means; wherein said service providing means, upon receiving said upload data message, examines the validity of a telephone micro-check that is included in said upload data message by comparing said telephone micro-check with registration information for said electronic telephone card that is registered in said service director information storage means, and generates and then transmits, to said electronic telephone card settlement means, an update data message that includes update data for said second storage means for said electronic telephone card settlement means; and wherein said electronic telephone card settlement means extracts said update data from said update data message that is received, and updates data stored in said second storage means.

119. A mobile electronic commerce system according to claim 28, wherein a first electronic wallet generates a telephone card transfer offer message offering to transfer, to a second electronic wallet, an electronic telephone card that is stored in said second storage means, and transmits said telephone card transfer offer message via said wireless communication means to said second electronic wallet; wherein said second electronic wallet, upon receiving said telephone card transfer offer message, generates a telephone card transfer offer response message indicating that the contents of said telephone card transfer offer message are accepted, and then transmits said telephone card transfer offer response message via said wireless communication means to said first electronic wallet; and wherein said first electronic wallet, upon receiving said telephone card transfer offer response message, generates and then transmits, to said second electronic wallet, a telephone card transfer certificate message confirming the transfer of said electronic telephone card to said second electronic wallet.

120. A mobile electronic commerce system according to claim 119, wherein said telephone card transfer offer message includes:

presented card information and a card certificate or a registered card certificate for said electronic telephone card; and
state management information accompanied by a digital signature added by using a card signature private key.

121. A mobile electronic commerce system according to claim 119, wherein said telephone card transfer offer message includes a public key certificate for the owner of said first electronic wallet; the digital signature of said owner of said first electronic wallet is provided for said telephone card transfer offer message; wherein said telephone card transfer offer response message includes a public key certificate for the owner of said second electronic wallet; wherein the digital signature of said owner of said second electronic wallet is provided for said telephone card transfer offer message; wherein said telephone card transfer certificate message includes identification information for said public key certificate for said owner of said first electronic wallet and identification information for said public key certificate for said owner of said second electronic wallet; and wherein a digital signature using a card signature private key for said electronic telephone card and the digital signature of said owner of said first electronic wallet are provided for said telephone card transfer certificate message.

122. A mobile electronic commerce system according to claim 45, wherein identification information that describes a payment method selected by said input means of said electronic wallet is included in said ticket application message issued by said electronic wallet when requesting the purchase of an electronic ticket.

123. A mobile electronic commerce system according to claim 91, wherein said electronic ticket issuance request message or said electronic ticket installation request message includes template program identification information for designating, following the order that is to be used for the generation of electronic tickets, one of a plurality of template programs that are stored in said ticket issuer information storage means.

124. A mobile electronic commerce system according to claim 90, wherein said electronic ticket issuance request message or said electronic ticket installation request message includes representative component information describing representative component information for an electronic ticket that is to be generated.

125. A mobile electronic commerce system according to claim 88, wherein said electronic wallet generates and then transmits, to said service providing means, a ticket registration request message requesting that said service providing means register, as an electronic ticket that is to be used by the owner of said electronic wallet said electronic ticket stored in said second storage means for said electronic wallet; wherein said service providing means, upon receiving said ticket registration request message, newly generates, for said electronic ticket, a ticket signature private key, a ticket signature public key and a registered ticket certificate for verifying said ticket signature public key, registers said electronic ticket for use in said service director information storage means, and then transmits, to said electronic wallet, said ticket signature private key and said registered ticket certificate; and wherein said electronic wallet updates said ticket signature private key and said registered ticket certificate that are stored by replacing them with those that have been newly received, and changes said state management information for said electronic ticket to a usable state.

126. A mobile electronic commerce system according to claim 28, wherein said electronic wallet generates a ticket presenting message in which is designated an electronic ticket that is selected, from among those stored in said second storage means, by input means for said electronic wallet, and transmits said ticket presenting message to said electronic ticket examination means.

127. A mobile electronic commerce system according to claim 126, wherein said electronic ticket examination means, upon receiving said ticket presenting message, generates and then transmits, to said electronic wallet, a ticket examination message instructing the modification of said electronic ticket to a post-examined state; wherein said electronic wallet, upon receiving said ticket examination message, changes said electronic ticket to said post-examined state, and generates and then transmits, to said electronic ticket examination means, a ticket examination response message that describes the contents of the modified electronic ticket; wherein said electronic ticket examination means stores said received ticket examination response message in said second storage means for said electronic ticket examination means, and generates and then transmits, to said electronic wallet, an examination certificate message certifying that said electronic ticket has been examined; and wherein said electronic wallet stores said received examination certificate message in said second storage means for said electronic wallet.

128. A mobile electronic commerce system according to claim 126, wherein said ticket presenting message includes:

presented ticket information and a registered ticket certificate for said electronic ticket; and state management information accompanied by a digital signature provided by using a ticket signature private key.

129. A mobile electronic commerce system according to claim 88, wherein said ticket examination response message includes:

state management information for said electronic ticket; identification information for said electronic ticket examination means; and identification information for the owner of said electronic ticket examination means, and wherein a digital signature is provided for said ticket examination response message by using said ticket signature private key for said electronic ticket.

130. A mobile electronic commerce system according to claim 129, wherein said ticket examination response message includes identification information for said electronic ticket examination means and identification information for the owner of said electronic ticket examination means, and wherein said digital signature prepared using said ticket signature private key for said electronic ticket and the digital signature of the owner of said electronic wallet are provided for said ticket examination response message.

131. A mobile electronic commerce system according to claim 47, wherein said ticket examination response message includes a ticket examination number representing the order in which ticket examination response messages are generated by said electronic ticket.

132. A mobile electronic commerce system according to claim 127, wherein, at a time designated by said

service providing means, said electronic ticket examination means generates an upload data message that includes data stored in said second storage means for said electronic ticket examination means, and then transmits said upload data message to said service providing means; wherein said service providing means, upon receiving said upload data message, determines the validity of a ticket examination response that is included in said upload data message by comparing said ticket examination response with registration information for said electronic ticket that is registered in said service director information storage means, and generates and then transmits, to said electronic ticket examination means, an update data message that includes update data for said second storage means for said electronic ticket examination means; and wherein said electronic ticket examination means extracts said update data from said update data message that is received, and updates data stored in said second storage means.

133. A mobile electronic commerce system according to claim 28, wherein a first electronic wallet generates a ticket transfer offer message offering to transfer, to a second electronic wallet, an electronic ticket that is stored in said second storage means, and then transmits said ticket transfer offer message via said wireless communication means to said second electronic wallet; wherein said second electronic wallet, upon receiving said ticket transfer offer message, generates a ticket transfer offer response message indicating the contents of said ticket transfer offer message are acceptable, and then transmits said ticket transfer offer response message via said wireless communication means to said first electronic wallet; and wherein said first electronic wallet, upon receiving said ticket transfer offer response message, generates and then transmits, to said second electronic wallet, a ticket transfer certificate message confirming the transfer of said electronic ticket to said second electronic wallet.

134. A mobile electronic commerce system according to claim 133, wherein said ticket transfer offer message includes:

presented ticket information and a ticket certificate or a registered ticket certificate for said electronic ticket; and
state management information accompanied by a digital signature that is added by using a ticket signature private key.

135. A mobile electronic commerce system according to claim 133, wherein said ticket transfer offer message includes a public key certificate for the owner of said first electronic wallet; wherein the digital signature of said owner of said first electronic wallet is provided for said ticket transfer offer message; wherein said ticket transfer offer response message includes a public key certificate for the owner of said second electronic wallet; wherein the digital signature of said owner of said second electronic wallet is provided for said ticket transfer offer message; wherein said ticket transfer certificate message includes identification information for said public key certificate for said owner of said first electronic wallet and identification information for said public key certificate for said owner of said second electronic wallet; and wherein a digital signature using a ticket signature private key for said electronic ticket and the digital signature of said owner of said first electronic wallet are provided for said ticket transfer certificate message.

136. A mobile electronic commerce system according to claim 39, wherein settlement option information for deciding which procedures to use for settlement is included in said electronic payment card issuance request message, in said electronic telephone card issuance request message or in said electronic ticket issuance request message.

137. A mobile electronic commerce system according to claim 136, wherein said service providing means, upon receiving said electronic payment card issuance request message, said electronic telephone card issuance request message or said electronic ticket issuance request message, generates and then transmits, to said electronic wallet, an electronic payment card, an electronic telephone card or an electronic ticket before performing a price settlement in accordance with said settlement option information.

138. A mobile electronic commerce system according to claim 39, wherein said service providing means, upon receiving said electronic payment card issuance request message, said electronic telephone card issuance request message or said electronic ticket issuance request message, generates and then transmits, to said electronic wallet, an electronic payment card, an electronic telephone card or an electronic ticket, and a temporary receipt message describing the contents of a settlement before performing a price settlement in accordance with said settlement option information.

139. A mobile electronic commerce system according to claim 28, wherein data concerning said electronic payment card, said electronic telephone card and said electronic ticket belonging to the owner of said electronic wallet, and data processed by said central processing unit of said electronic wallet are stored in said second storage means for said electronic wallet or in said user information storage means for said service providing means; wherein said data are managed by describing, in said second storage means for said electronic wallet, identification information for said data, and addresses of said data in said corresponding storage means; wherein, when data at an address in said user information storage means are to be processed, said electronic wallet generates and then transmits, to said service providing means, a remote access request message requesting address data; wherein said service providing means, upon receiving said remote access request message, generates and then transmits, to said electronic wallet, a remote access data message in which said requested data are included; and wherein said electronic wallet, upon receiving said remote access data message, extracts said requested data from said message.

140. A mobile electronic commerce system according to claim 1, wherein said electronic wallet employs a ferroelectric nonvolatile memory as storage means.

141. A mobile electronic commerce system according to claim 10, wherein a ferroelectric nonvolatile memory is employed as storage means for said electronic payment card settlement means.

142. A printed matter according to claim 63, wherein said object is one whereon or wherein electronic payment card installation information, electronic telephone card installation information, or electronic ticket installation information is printed or engraved in a form readable by a person or reading means.

143. A printed matter according to claim 142, wherein a coating is applied to a portion of said object whereon or wherein said electronic payment card installation information, said electronic telephone card installation information or said electronic ticket installation information is printed or engraved in order to disable the reading of said electronic payment card installation information, said electronic telephone card installation information or said electronic ticket installation information, and wherein said coating is removable.

144. A printed matter according to claim 142, wherein, to prevent holographic counterfeiting, a micro-character or a micro-pattern is printed on or etched in said object.

145. A recording medium according to claim 64, on which electronic payment card installation information, electronic telephone card installation information, or electronic ticket installation information is recorded using a form that is readable by recording/reproduction means.

146. A recording medium, on which a control program for said central processing unit of said electronic wallet defined in claim 28 is stored in a form readable by a computer.

147. A recording medium, on which a control program for said central processing unit of said electronic payment card settlement means defined in claim 29 is recorded in a form readable by a computer.

148. A recording medium, on which a control program for said central processing unit of said electronic telephone card settlement means defined in claim 32 is recorded in a form readable by a computer.

149. A recording medium, on which a control program for said central processing unit of said electronic ticket examination means defined in claim 33 is recorded in a form readable by a computer.

150. A recording medium, on which a processing program for said computer system of said service providing means defined in claim 34 is recorded in a form readable by a computer.

151. A recording medium, on which a processing program for said computer system of said settlement processing means defined in claim 35 is recorded in a form readable by a computer.

152. A recording medium, on which a processing program for said computer system of said payment card issuing means defined in claim 36 is recorded in a form readable by a computer.

153. A recording medium, on which a processing program for said computer system of said telephone card issuing means defined in claim 37 is recorded in a form readable by a computer.

154. A recording medium, on which a processing program for said computer system of said ticket issuing means defined in claim 38 is recorded in a form readable by a computer.

155. An electronic wallet used for a mobile electronic commerce system for paying, via wireless communication means, a required amount from said electronic wallet that includes said wireless communication means and for receiving a product or a service, or a required permission, from a supply side, said electronic wallet comprising:

input means for entering a numerical value and for performing a selection operation;
a central processing unit for generating data to be transmitted via said wireless communication means, and for processing data received via said wireless communication means;
first storage means for storing a control program for controlling an operation performed by said central processing unit;
display means for displaying data processed by said central processing unit;
second storage means for storing said data processed by said central processing unit, and an electronic negotiable card received through said wireless communication means; and
third storage means for storing identification information and authorization information for the user of said electronic wallet,
wherein for carrying, said third storage means is detachable from said electronic wallet,
wherein, when said third storage means is removed from said electronic wallet, said electronic negotiable card stored in said second storage means is erased, and
wherein, when said third storage means is attached to said electronic wallet, said electronic wallet communicates with said service providing means via said wireless communication means, and receives said electronic negotiable card that said user of said electronic wallet owns and stores said electronic negotiable card in said second storage means.

156. An electronic wallet, used for a mobile electronic commerce system for paying, via wireless communication means, a required amount from said electronic wallet that includes said wireless communication means and for receiving a product or a service, or a required permission, from a supply side, said electronic wallet comprising:

input means for entering a numerical value and for performing a selection operation;
a central processing unit for generating data to be transmitted via said wireless communication means, and for processing data received via said wireless communication means;
first storage means for storing a control program for controlling an operation performed by said central processing unit;
display means for displaying data processed by said central processing unit;
second storage means for storing said data processed by said central processing unit; and
third storage means for storing an electronic negotiable card received via said wireless communication means,
wherein for carrying, said third storage means is detachable from said electronic wallet.

157. An electronic wallet, used for a mobile electronic commerce system for paying, via wireless communication means, a required amount from said electronic wallet that includes said wireless communication means and for receiving a product or a service, or a required permission, from a supply side, said electronic wallet comprising:

input means for entering a numerical value and for performing a selection operation;
a central processing unit for generating data to be transmitted via said wireless communication means, and for processing data received via said wireless communication means;
first storage means for storing a control program for controlling an operation performed by said central processing unit;
display means for displaying data processed by said central processing unit;
second storage means for storing said data processed by said central processing unit; and
IC card reading/writing means,
wherein said electronic negotiable card received via said wireless communication means is stored in an IC card that is loaded in said IC card reading/writing means.

158. An electronic wallet comprising:

wireless communication means;

means for installing a program for an electronic negotiable card obtained from a predetermined agency via said wireless communication means; and

means for, in order to receive a product or a service from a seller or to obtain a permission, employing said electronic negotiable card with said wireless means in accordance with said program for said electronic negotiable card.

159. An electronic wallet according to claim 158, wherein an inherent private key for providing a digital signature for data to be transmitted to said seller is included in said program for said electronic negotiable card, so that said electronic negotiable card is employed by means provided for employing said electronic negotiable card.

160. An electronic wallet according to claim 158, further comprising:

means for, when said installation means receives a modification instruction message from said predetermined agency instructing a change to said program for said electronic negotiable card, changing, in accordance with said modification instruction message, said program for said negotiable card that is installed.

161. An electronic wallet according to claim 158, further comprising:

means for, when a modification notification message for the changing of the contents of said program for said electronic negotiable card is received from said predetermined agency, generating a reaction selection message indicating that the modification of the contents of said program is accepted; and

means for, when said installation means receives a modification instruction message from said predetermined agency instructing the changing of said program for said electronic negotiable card, changing in accordance with said modification instruction message said program for said negotiable card that is installed.

162. An electronic wallet according to claim 158, further comprising:

means for, when a modification notification message that the contents of said electronic negotiable card is to be changed is received from said predetermined agency, generating a reaction selection message requesting a refund process for said electronic negotiable card, and for transmitting said reaction selection message to said predetermined agency; and

means for, when a refund receipt message is received from said predetermined agency indicating the termination of said refund process, deleting said program for said negotiable card that is installed.

163. An electronic wallet according to claim 158, wherein said program for said negotiable card is a coupon ticket that has at least two functions for a payment card, a telephone card and a ticket.

164. A seller terminal comprising:

wireless communication means;

means for installing, from a predetermined agency, a program module that defines a settlement process performed by a seller when an electronic negotiable card is used; and

means for, in accordance with said program module, communicating with an electronic wallet via said wireless communication means and for performing said settlement process for said seller when said electronic negotiable card is employed.

165. An automatic vending machine comprising:

wireless communication means;

means for installing, from a predetermined agency, a program module that defines a settlement process

performed by said automatic vending machine when an electronic negotiable card is used;
means for, in accordance with said program module, communicating with an electronic wallet via said wireless communication means and for performing said settlement process for said automatic vending machine when said electronic negotiable card is employed; and
means for providing a product or a service when said settlement process for said automatic vending machine has been completed.

166. A call switching center machine comprising:

wireless communication means;
means for installing, from a predetermined agency, a program module that defines a settlement process performed by said call switching center machine when an electronic negotiable card is used;
means for, in accordance with said program module, communicating with an electronic wallet via said wireless communication means and for performing said settlement process for said call switching center machine when said electronic negotiable card is employed; and
means for providing a product or a service when said settlement process for said call switching center machine has been completed.

167. A management machine for a service providing agency comprising:

communication means;
means for generating a program for an electronic negotiable card in order to install said program in an electronic wallet, and for transmitting said program for said electronic negotiable card to said electronic wallet by radio via said communication means; and
means for transmitting to a seller terminal, in order to install said program in said seller terminal, a program module that defines a settlement process performed by a seller when said program for said electronic negotiable card is employed.

168. A management machine for a service providing agency comprising:

communication means;
means for receiving from an electronic wallet, by radio via said communication means, a purchase order request for a program for an electronic negotiable card;
means for receiving data, concerning a negotiable card that is to be issued, from a negotiable card issuing agency that issues said electronic negotiable card that is ordered by said purchase order request;
means for performing, together with a settlement agency, a settlement process that accompanies the purchase of said negotiable card;
means for generating a program for an electronic negotiable card, based on data that are received from said negotiable card issuing agency and that concern a negotiable card to be issued, and for transmitting said program for said negotiable card to said electronic wallet by radio via said communication means; and
means for transmitting to a seller terminal, in order to install said program in said seller terminal, a program module that defines a settlement process performed by a seller when said program for said electronic negotiable card is employed.

169. A management machine for a negotiable card program issuing agency according to claim 168, further comprising:

means for generating a modification instruction message for changing said program for said negotiable card that is installed in said electronic wallet; and
means for transmitting said modification instruction message to said electronic wallet via said communication means.

170. A management machine for a negotiable card program issuing agency according to claim 168, further comprising:

means for generating a modification notification message for the modification of said program for said

negotiable card that is installed in said electronic wallet;
means for receiving, from said electronic wallet, a reaction selection message indicating said modification has been accepted;
means for, upon receiving said reaction selection message, generating a modification instruction message for changing said program for said negotiable card that is installed in said electronic wallet; and
means for transmitting said modification instruction message to said electronic wallet via said communication means.

171. A management machine for a negotiable card program issuing agency according to claim 168, further comprising:

means for generating a modification notification message for the modification of said program for said negotiable card that is installed in said electronic wallet;
means for receiving from said electronic wallet, in response to said modification notification, a reaction selection message requesting a refund for said electronic negotiable card;
means for, upon receiving said reaction selection message, performing a refund settlement process for a predetermined settlement agency;
means for generating a refund receipt message indicating that said refund settlement process has been completed; and
means for transmitting said refund receipt message to said electronic wallet via said communication means.

172. A management machine for a service providing agency, which transmits, to an electronic wallet, an electronic negotiable card program, including a card signature private key, a card certificate, a card authorization private key and an accounting machine authorization private key, and which transmits to a seller terminal a settlement program, including a card authorization public key that is paired with said card authorization private key and an accounting machine authorization private key that is paired with said accounting machine authorization public key, said management machine comprising:

means for managing, for each negotiable card type, the pair comprising said card authorization private key, which differs for each negotiable card type, and said card authorization public key, and the pair comprising said accounting machine authorization private key and said accounting machine authorization public key; and
means for, in order to issue a negotiable card, generating a card signature private key, which is inherent to said negotiable card, and a card certificate, and for generating a negotiable card by using said card authorization private key, which corresponds to the type of said negotiable card, and said accounting machine authorization public key.

173. A mobile electronic commerce system according to claim 3, wherein said electronic wallet includes means for generating first identification information for identifying a transaction conducted with said supply side, and for transmitting said first identification information to said supply side; wherein said supply side includes means for generating second identification information for identifying a transaction conducted with said electronic wallet, and for transmitting said second identification information to said electronic wallet; wherein said electronic wallet includes means for generating said electronic check that contains first said information and said second information; and wherein said supply side includes means for generating a receipt that contains said first identification information and said second identification information.

174. A mobile electronic commerce system according to claim 50, wherein said first electronic wallet includes means for generating first identification information for identifying an electronic payment card transfer process performed with said second electronic wallet, and for transmitting said first identification information to said second electronic wallet; wherein said second electronic wallet includes means for generating second identification information for identifying an electronic payment card transfer process performed with said first electronic wallet, and for transmitting said second identification information to said first electronic wallet; wherein said first electronic wallet includes means for generating said payment card transfer certificate message that contains said first identification information and said second identification information; and wherein said second electronic wallet includes means for generating said payment card receipt message that contains said first identification information and said second identification information.

175. A mobile electronic commerce system according to claim 52, wherein said first electronic wallet includes means for generating first identification information for identifying an electronic telephone card transfer process performed with said second electronic wallet, and for transmitting said first identification information to said second electronic wallet; wherein said second electronic wallet includes means for generating second identification information for identifying an electronic telephone card transfer process performed with said first electronic wallet, and for transmitting said second identification information to said first electronic wallet; wherein said first electronic wallet includes means for generating said telephone card transfer certificate message that contains said first identification information and said second identification information; and wherein said second electronic wallet includes means for generating said telephone card receipt message that contains said first identification information and said second identification information.

176. A mobile electronic commerce system according to claim 54, wherein said first electronic wallet includes means for generating first identification information for identifying an electronic ticket transfer process performed with said second electronic wallet, and for transmitting said first identification information to said second electronic wallet; wherein said second electronic wallet includes means for generating second identification information for identifying an electronic ticket transfer process performed with said first electronic wallet, and for transmitting said second identification information to said first electronic wallet; wherein said first electronic wallet includes means for generating said ticket transfer certificate message that contains said first identification information and said second identification information; and wherein said second electronic wallet includes means for generating said ticket receipt message that contains said first identification information and said second identification information.

177. A mobile electronic commerce system according to claim 54, wherein said first electronic wallet includes means for generating first identification information for identifying a negotiable card transfer process performed with said second electronic wallet, and for transmitting said first identification information to said second electronic wallet; wherein said second electronic wallet includes means for generating second identification information for identifying a negotiable card transfer process performed with said first electronic wallet, and for transmitting said second identification information to said first electronic wallet; wherein said first electronic wallet includes means for generating said payment card transfer certificate message that contains said first identification information and said second identification information; and wherein said second electronic wallet includes means for generating said payment card receipt message that contains said first identification information and said second identification information.

178. A recording medium on which is stored a program for an electronic payment card used by an electronic wallet in a mobile electronic commerce system for paying, via wireless communication means, a required amount from said electronic wallet that includes said wireless communication means, and for receiving a product or a service, or a required permission, from a supply side, and on which said program for said electronic payment card is so stored as to be readable by a computer, wherein said electronic payment card includes a payment card program, presented card information that describes the contents of said electronic payment card that is issued, and a card certificate for proving that said electronic payment card is real; wherein said payment card program further includes management information for the status of said electronic payment card, and payment card program data that specifies the operations performed by said electronic payment card; and wherein said presented card information is accompanied by the digital signature of the owner of the service providing means.

179. A recording medium according to claim 178, wherein said payment card program includes a card signature private key that is used for a digital signature for an electronic payment card, and wherein said card certificate is a public key certificate that verifies a card signature public key that is paired with said card signature private key.

180. A recording medium according to claim 178, wherein a clearing program module for said electronic payment card includes two cryptographic keys, an accounting machine authorization private key and a card authorization public key; and wherein said payment card program includes an accounting machine authorization public key that is paired with said accounting machine authorization private key, and a card authorization private key that is paired with said card authorization public key.

181. A recording medium according to claim 178, whereof said payment card program data includes a transaction module program, for specifying the procedures employed for message data that are exchanged by said electronic wallet and electronic payment card settlement means, a display module program, for specifying a display for an electronic payment card, and representative component information for an electronic payment card; and whereof, in accordance with said transaction module program for said

electronic payment card, a central processing unit in said electronic wallet processes said message data that are exchanged with said electronic payment card clearing means, and displays said representative component information in accordance with said display module program for said electronic payment card, so that said electronic payment card is displayed on display means of said electronic wallet.

182. A recording medium on which is stored a program for a negotiable card used by an electronic wallet in a mobile electronic commerce system for paying, via wireless communication means, a required amount from said electronic wallet that includes said wireless communication means, and for receiving a product or a service, or a required permission, from a supply side, and on which said program for said negotiable card is so stored as to be readable by a computer, wherein said negotiable card includes a negotiable card program, presented card information that describes the contents of said negotiable card that is issued, and a card certificate for proving that said negotiable card is authentic; wherein said negotiable card program further includes management information for the status of said negotiable card, and negotiable card program data that specifies the operations performed by said negotiable card; and wherein said presented card information is accompanied by the digital signature of the owner of the service providing means.

183. A recording medium according to claim 182, wherein said electronic negotiable card program includes a card signature private key that is used for a digital signature for an electronic negotiable card, and wherein said card certificate is a public key certificate that verifies a card signature public key that is paired with said card signature private key.

184. A recording medium according to claim 182, wherein a clearing program module for said electronic negotiable card includes two cryptographic keys, an accounting machine authorization private key and a card authorization public key; and wherein said negotiable card program includes an accounting machine authorization public key that is paired with said accounting machine authorization private key, and a card authorization private key that is paired with said card authorization public key.

185. A recording medium according to claim 178, whereof said negotiable card program data includes a transaction module program, for specifying the procedures employed for message data that are exchanged by said electronic wallet and electronic negotiable card settlement means, a display module program, for specifying a display for an electronic negotiable card, and representative component information for an electronic negotiable card; and whereof, in accordance with said transaction module program for said electronic negotiable card, a central processing unit in said electronic wallet processes said message data that are exchanged with said electronic negotiable card clearing means, and displays said representative component information in accordance with said display module program for said electronic negotiable card, so that said electronic negotiable card is displayed on display means of said electronic wallet.

186. A recording medium on which is stored a program for an electronic telephone card used by an electronic wallet in a mobile electronic commerce system for paying, via wireless communication means, a required amount from said electronic wallet that includes said wireless communication means, and for receiving a product or a service, or a required permission, from a supply side, and on which said program for said electronic telephone card is so stored as to be readable by a computer, wherein said electronic telephone card includes a telephone card program, presented card information that describes the contents of said electronic telephone card that is issued, and a card certificate for proving that said electronic telephone card is authentic; wherein said telephone card program further includes management information for the status of said electronic telephone card, and telephone card program data that specifies the operations performed by said electronic telephone card; and wherein said presented card information is accompanied by the digital signature of the owner of the service providing means.

187. A recording medium on which is stored a program for an electronic telephone card used by an electronic wallet in a mobile electronic commerce system for paying, via wireless communication means, a required amount from said electronic wallet that includes said wireless communication means, and for receiving a product or a service, or a required permission, from a supply side, and on which said program for said electronic telephone card is so stored as to be readable by a computer, wherein said telephone card program includes a card signature private key that is used for a digital signature for an electronic telephone card, and wherein said card certificate is a public key certificate that verifies a card signature public key that is paired with said card signature private key.

188. A recording medium on which is stored a program for an electronic telephone card used by an electronic wallet in a mobile electronic commerce system for paying, via wireless communication means, a required amount from said electronic wallet that includes said wireless communication means, and for

receiving a product or a service, or a required permission, from a supply side, and on which said program for said electronic telephone card is so stored as to be readable by a computer, whereof, in accordance with said transaction module program for said electronic telephone card, a central processing unit in said electronic wallet processes said message data that are exchanged with said electronic telephone card clearing means, and displays said representative component information in accordance with said display module program for said electronic telephone card, so that said electronic telephone card is displayed on display means of said electronic wallet, and whereof said telephone card program data includes a transaction module program, for specifying the procedures employed for message data that are exchanged by said electronic wallet and electronic telephone card settlement means, a display module program, for specifying a display for an electronic telephone card, and representative component information for an electronic telephone card.

189. A recording medium on which is stored a program for an electronic ticket used by an electronic wallet in a mobile electronic commerce system for paying, via wireless communication means, a required amount from said electronic wallet that includes said wireless communication means, and for receiving a product or a service, or a required permission, from a supply side, and on which said program for said electronic ticket is so stored as to be readable by a computer, wherein said electronic ticket includes a ticket program, presented card information that describes the contents of said electronic ticket that is issued, and a card certificate for proving that said electronic ticket is authentic; wherein said ticket program further includes management information for the status of said electronic ticket, and ticket program data that specifies the operations performed by said electronic ticket; and wherein said presented card information is accompanied by the digital signature of the owner of the service providing means.

190. A recording medium according to claim 189, wherein said ticket program includes a ticket signature private key that is used for a digital signature for an electronic ticket, and wherein said ticket certificate is a public key certificate that verifies a ticket signature public key that is paired with said ticket signature private key.

191. A recording medium according to claim 189, wherein an examination program module for said electronic ticket includes two cryptographic keys, a gate authorization private key and a ticket authorization public key; and wherein said ticket program includes a gate authorization public key that is paired with said gate authorization private key, and a ticket authorization private key that is paired with said ticket authorization public key.

192. A recording medium according to claim 189, whereof said ticket program data includes a transaction module program, for specifying the procedures employed for message data that are exchanged by said electronic wallet and electronic ticket examination means, a display module program, for specifying a display for an electronic payment card, and representative component information for an electronic ticket; and whereof, in accordance with said transaction module program for said electronic ticket, a central processing unit in said electronic wallet processes said message data that are exchanged with said electronic ticket examination means, and displays said representative component information in accordance with said display module program for said electronic ticket, so that said electronic ticket is displayed on display means of said electronic wallet.

193. A recording medium on which a program for a payment card, which is used for electronic commerce that employs an electronic wallet, is so stored as to be readable by a computer, and whereon as information indicating the contents of a negotiable card, included for said payment card, is ASCII information for which tag information that describes the information type is additionally provided.

194. A recording medium on which a program for a telephone card, which is used for electronic commerce that employs an electronic wallet, is so stored as to be readable by a computer, and whereon as information indicating the contents of an electronic telephone card, included for said telephone card, is ASCII information for which tag information that describes the information type is additionally provided.

195. A recording medium on which a program for a ticket, which is used for electronic commerce that employs an electronic wallet, is so stored as to be readable by a computer, and whereon as information indicating the contents of an electronic ticket, included for said ticket, is ASCII information for which tag information that describes the information type is additionally provided.

Data supplied from the esp@cenet database - Worldwide

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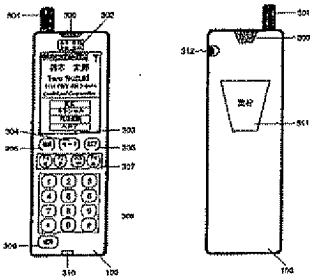


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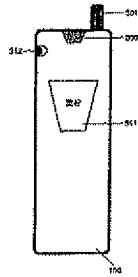


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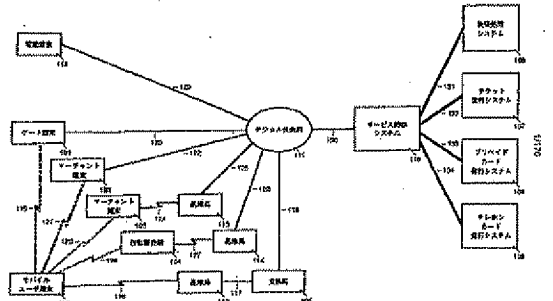


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図 1



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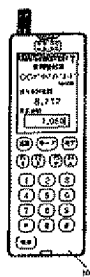
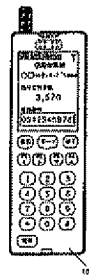


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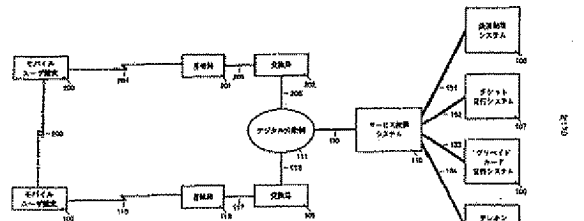


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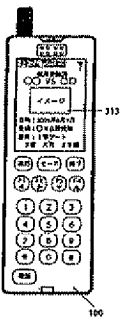


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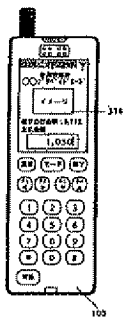
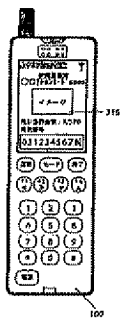


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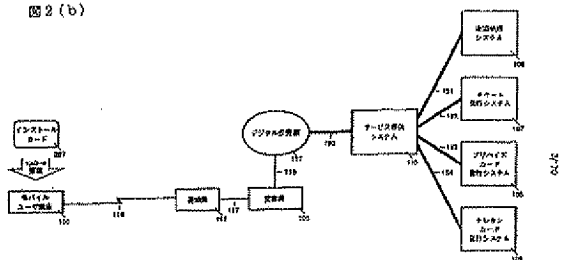


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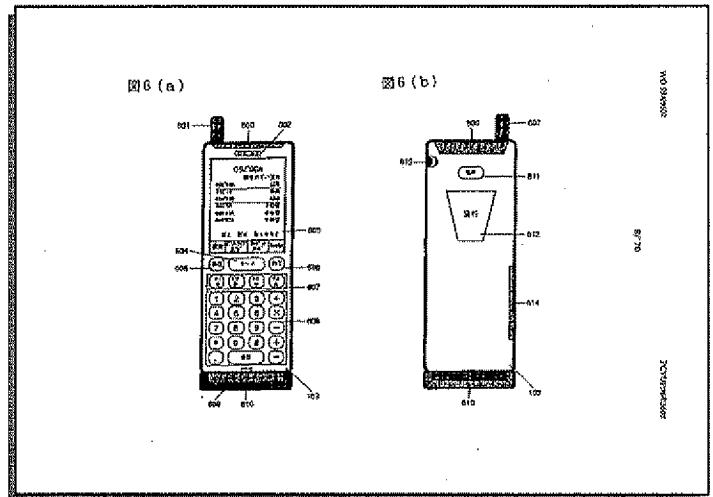
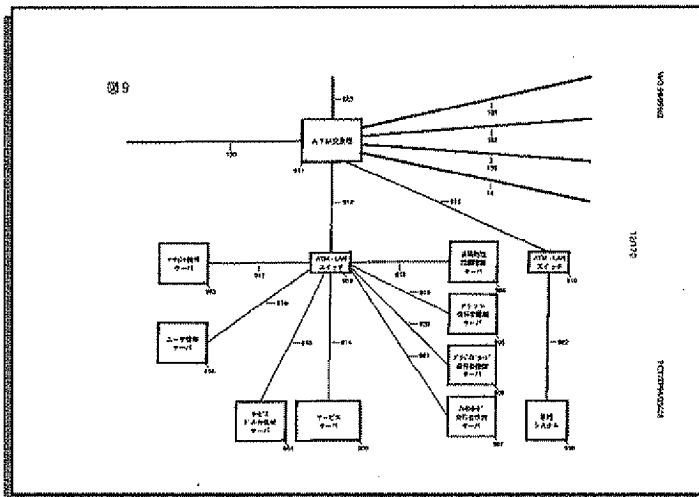
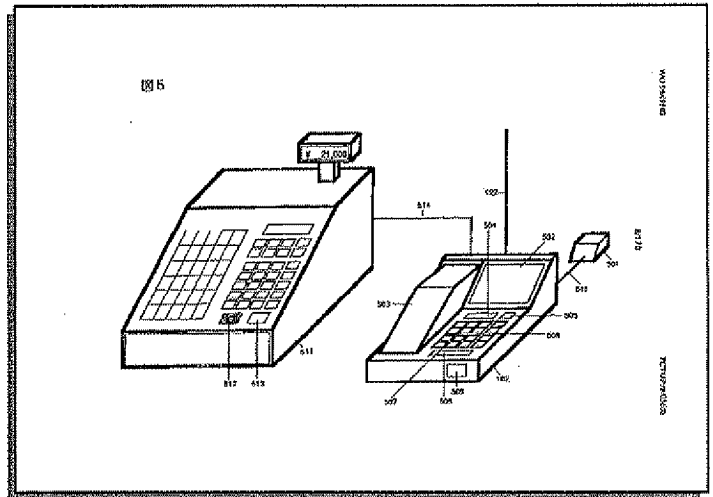
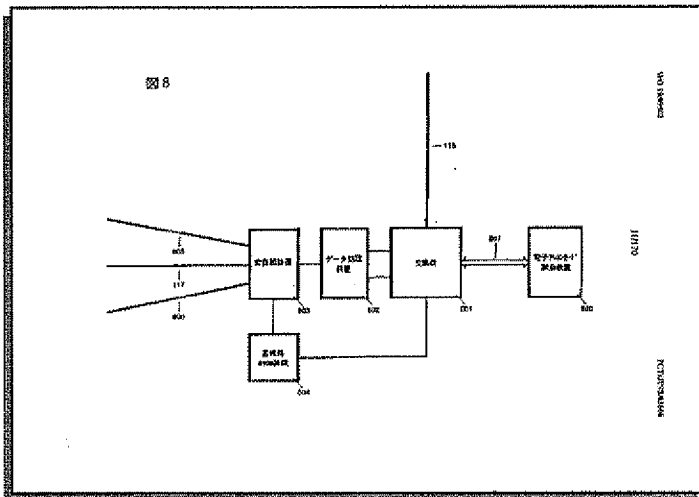
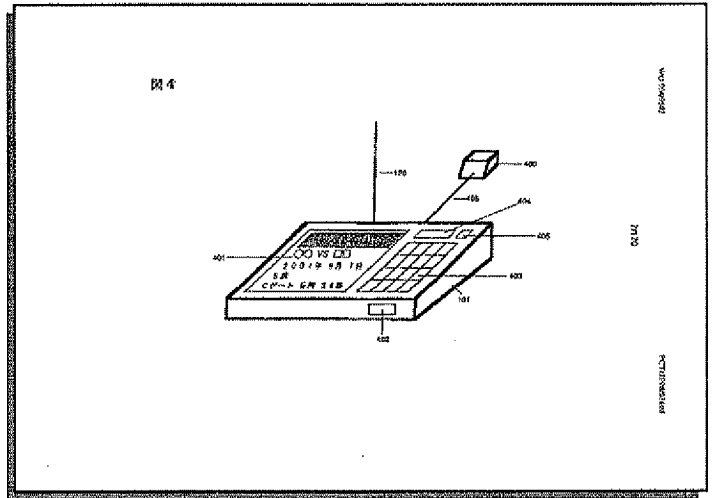
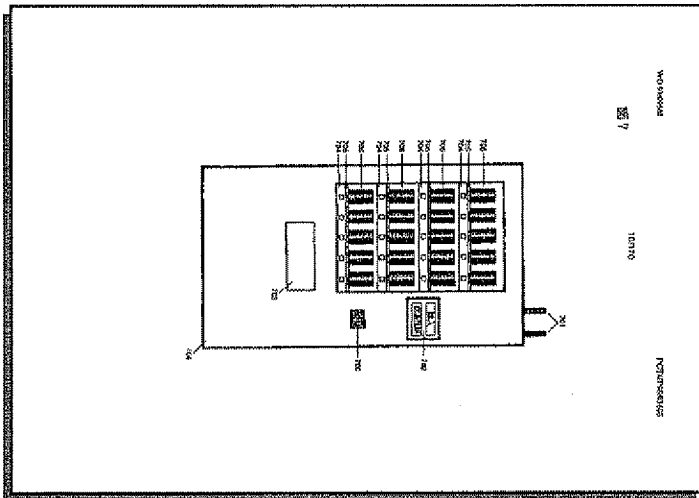
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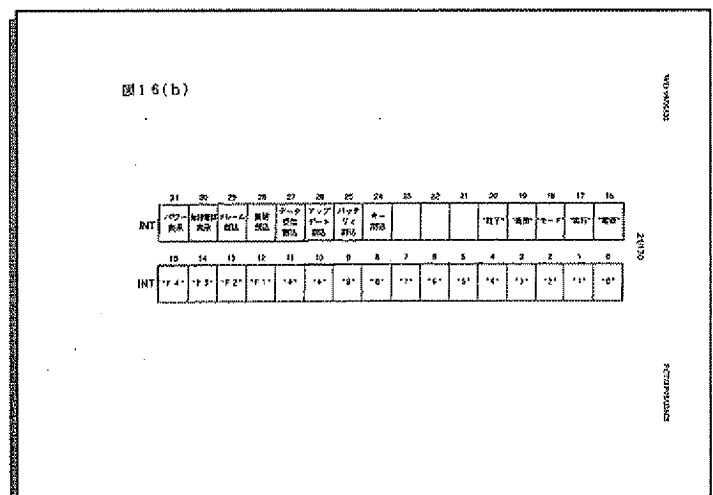
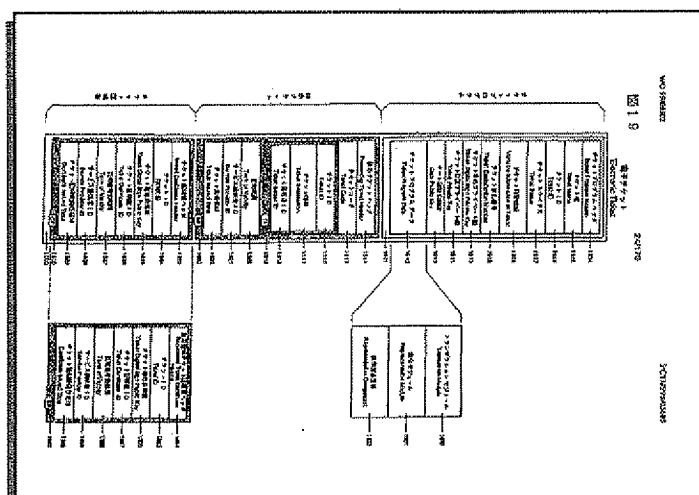
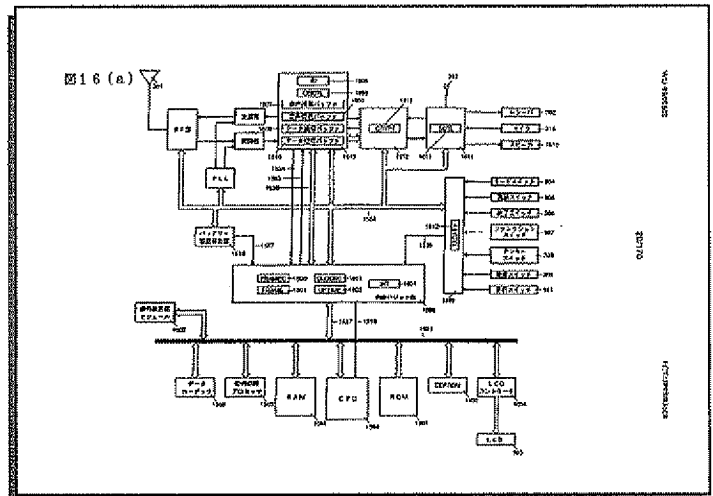
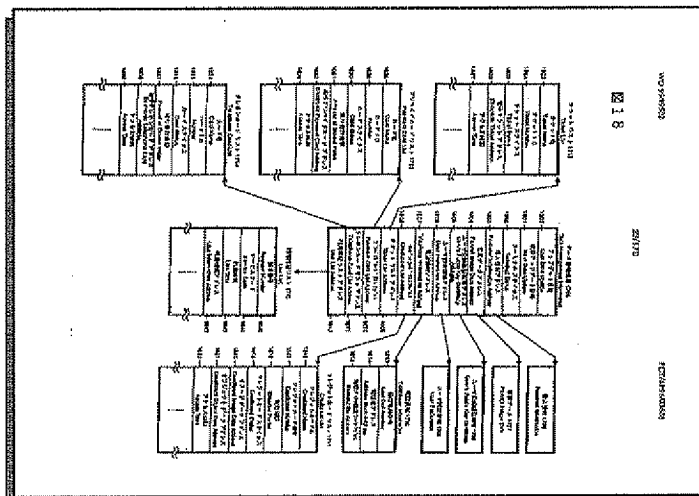
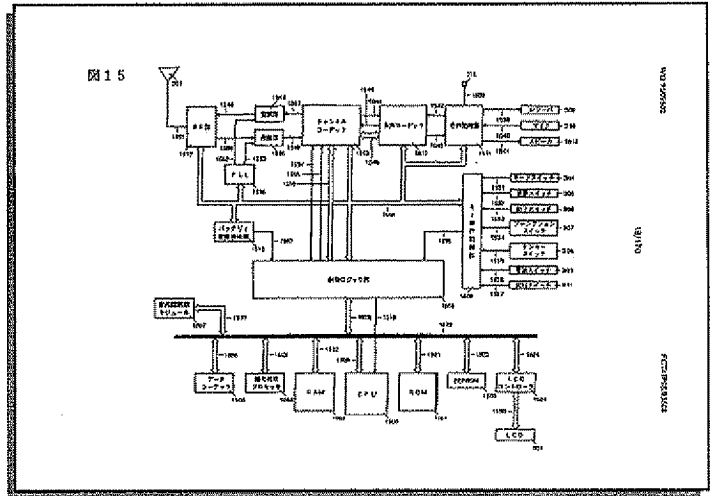
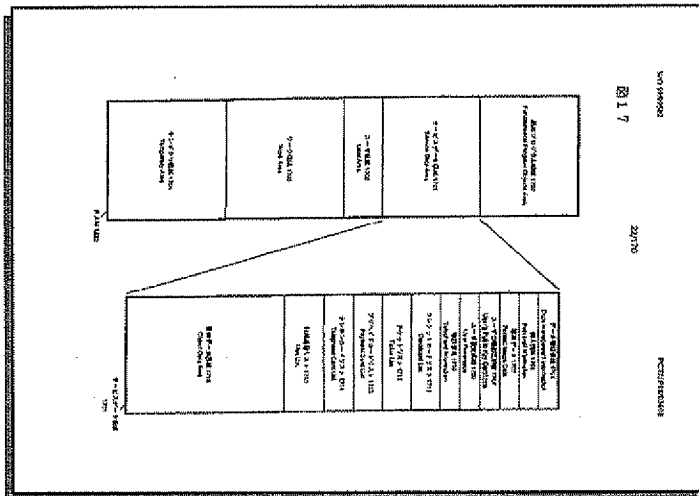


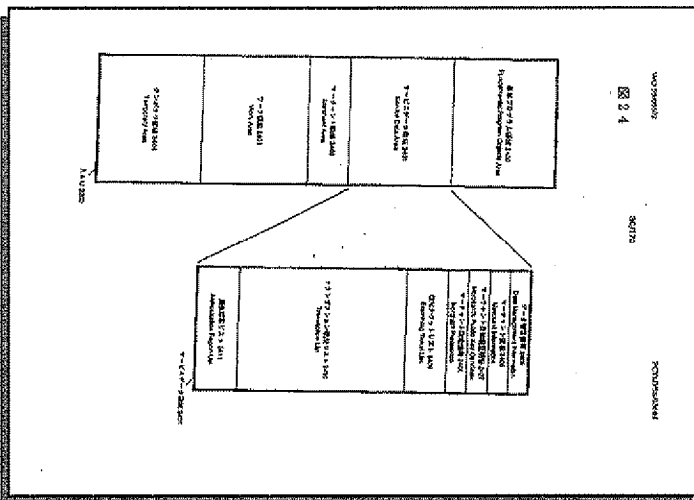
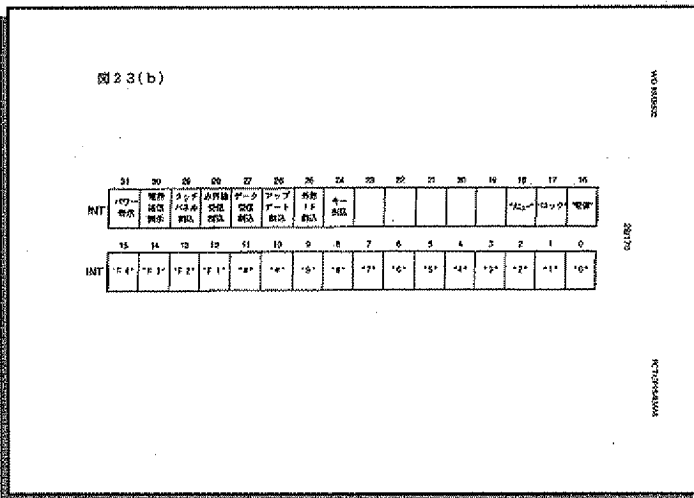
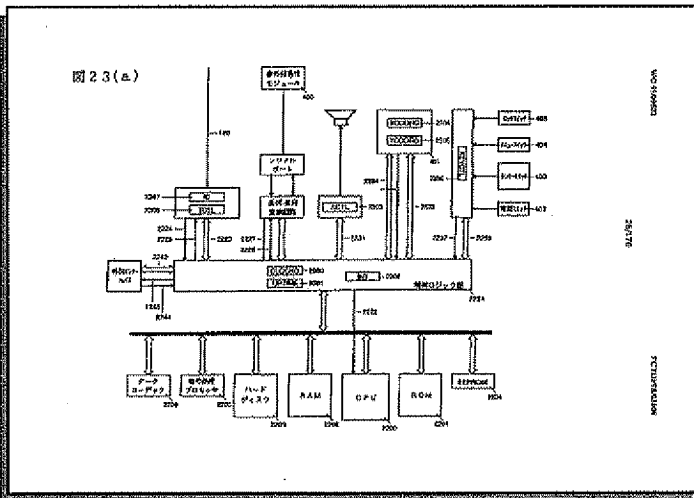
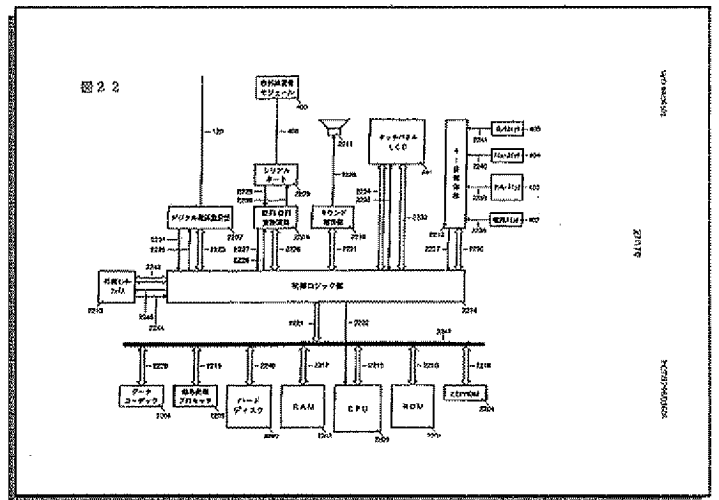
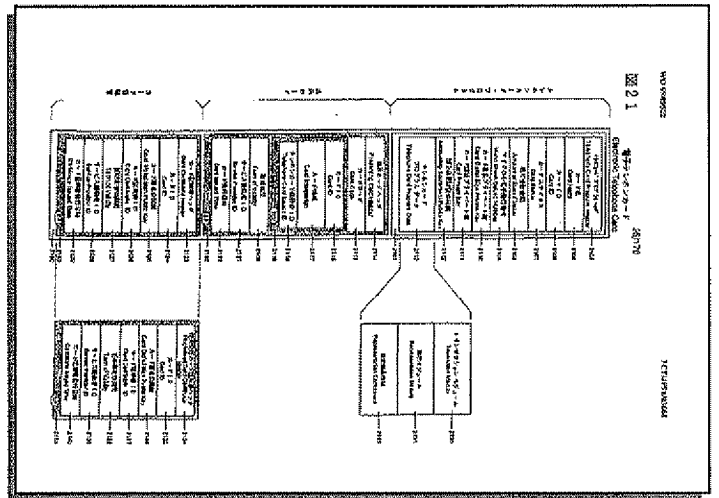
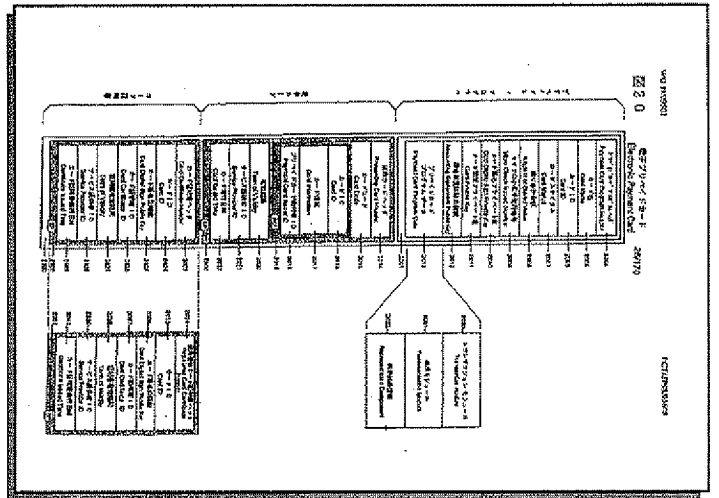
1256046-001

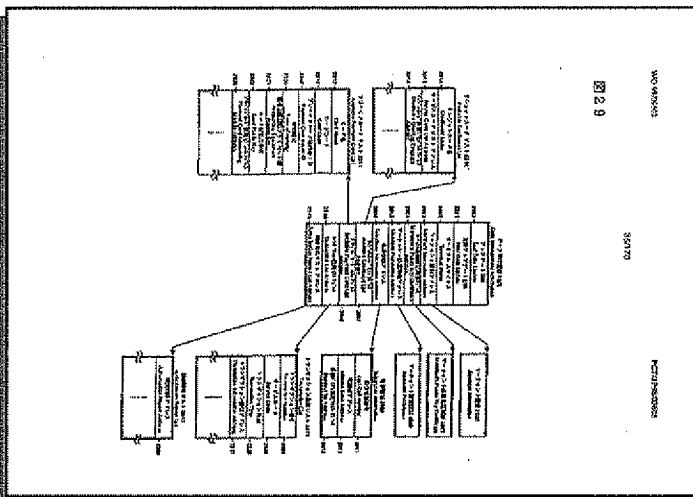
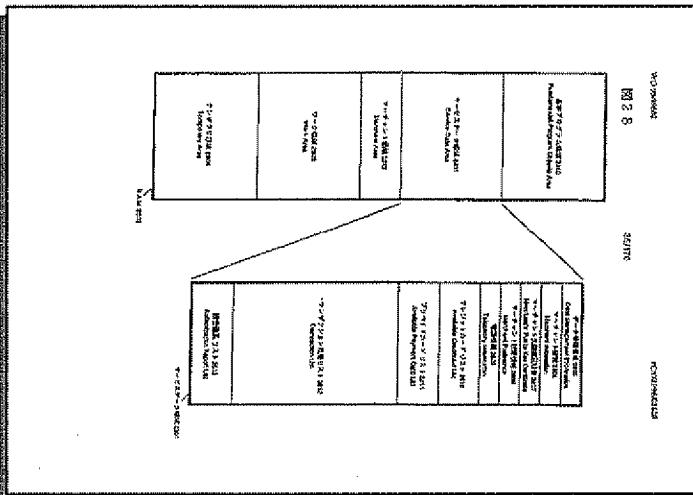
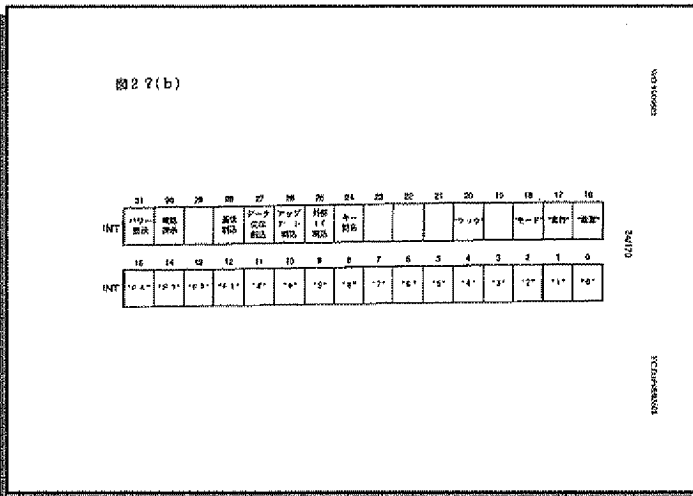
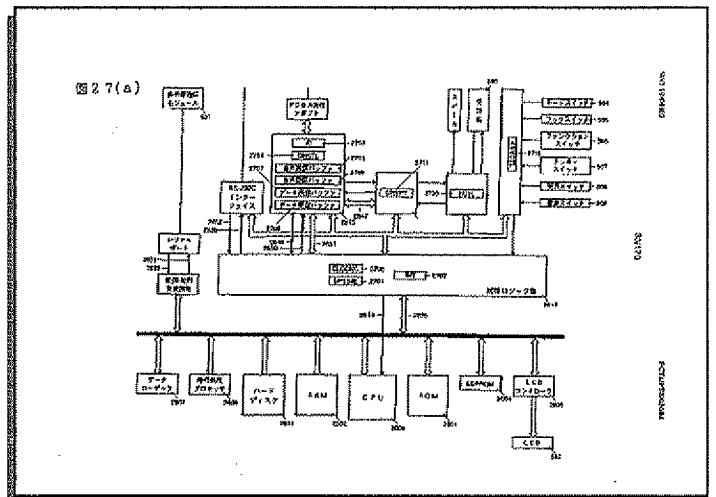
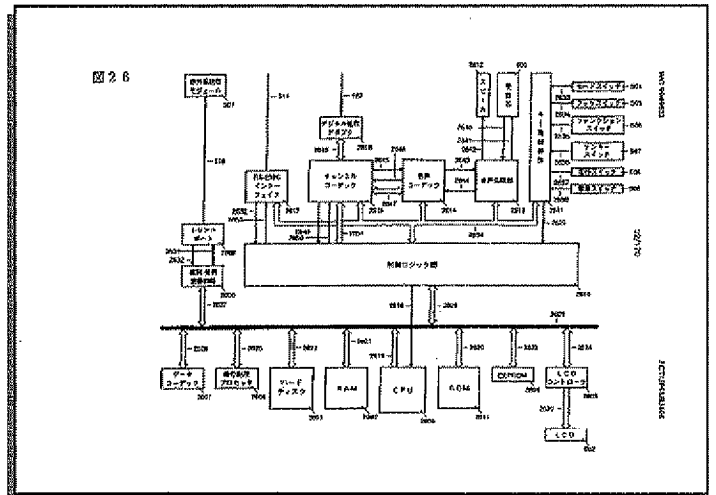
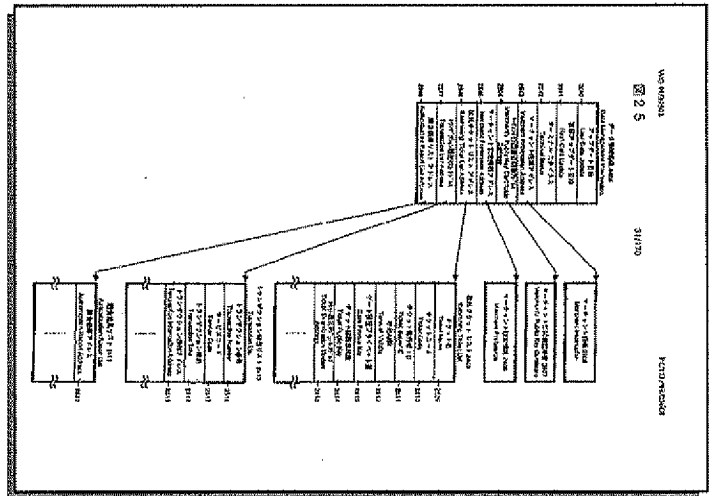
04/17/01

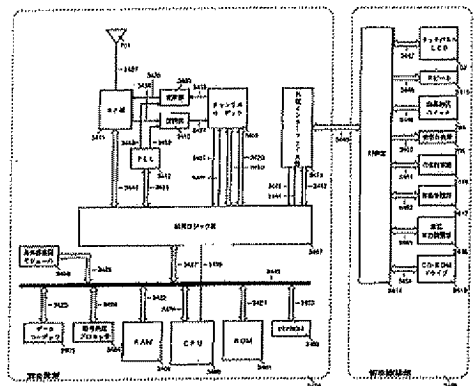
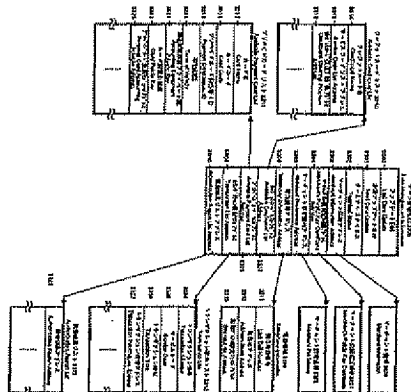
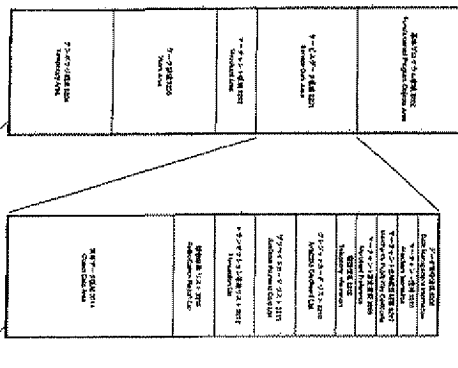
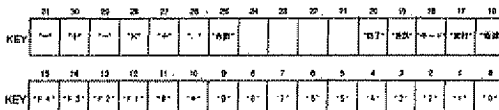
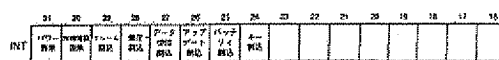
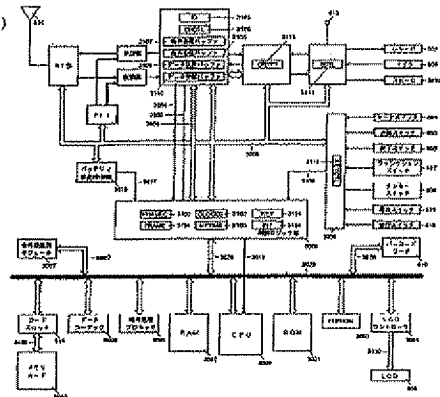
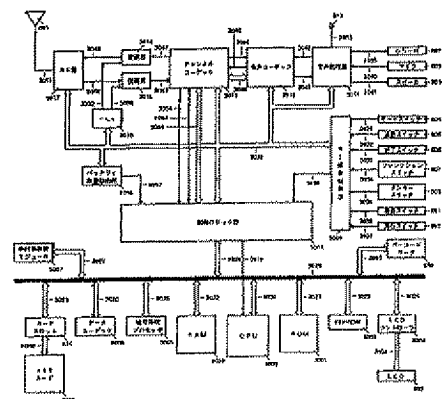
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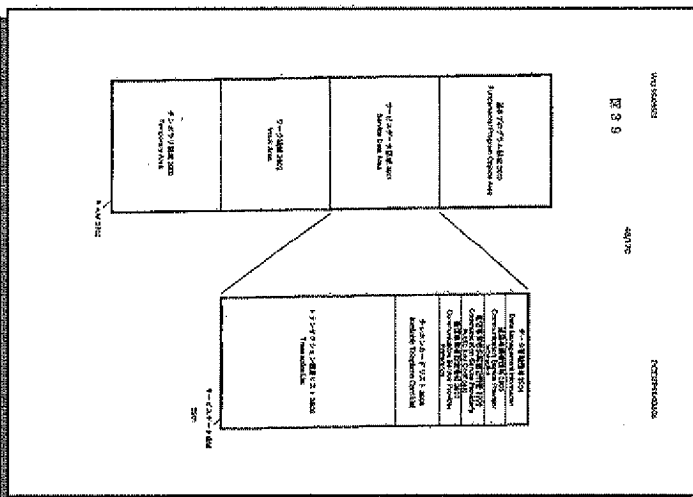
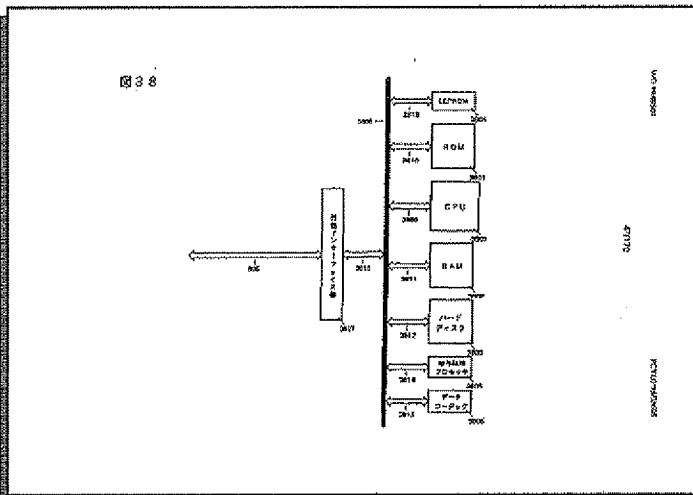
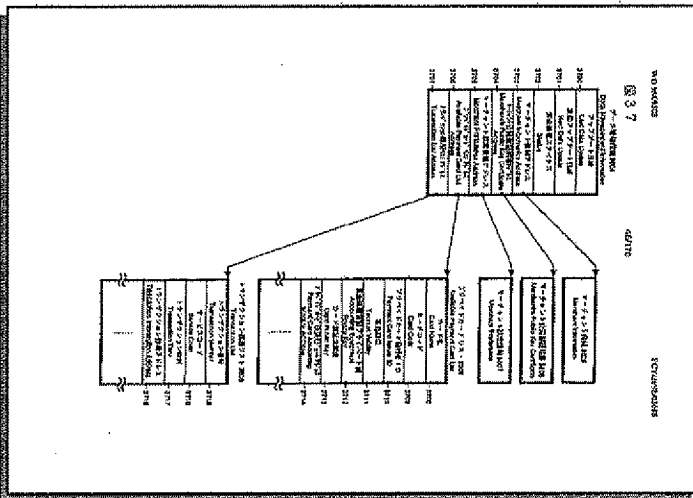
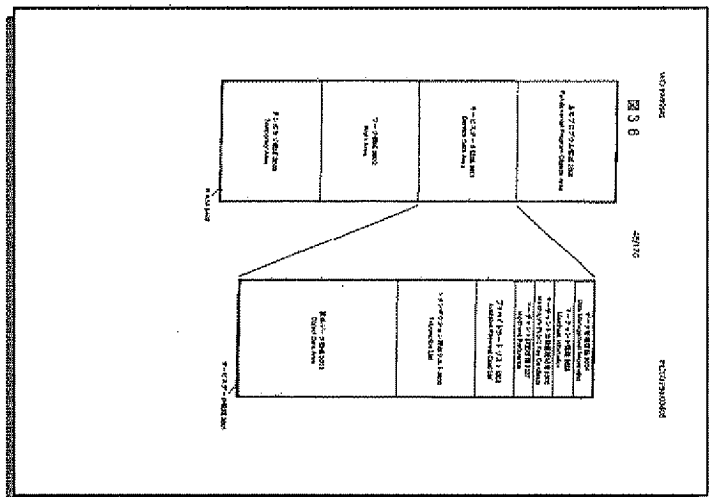
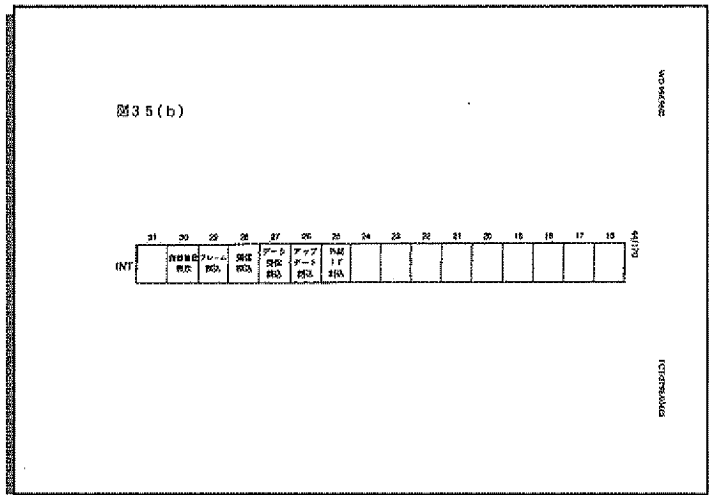
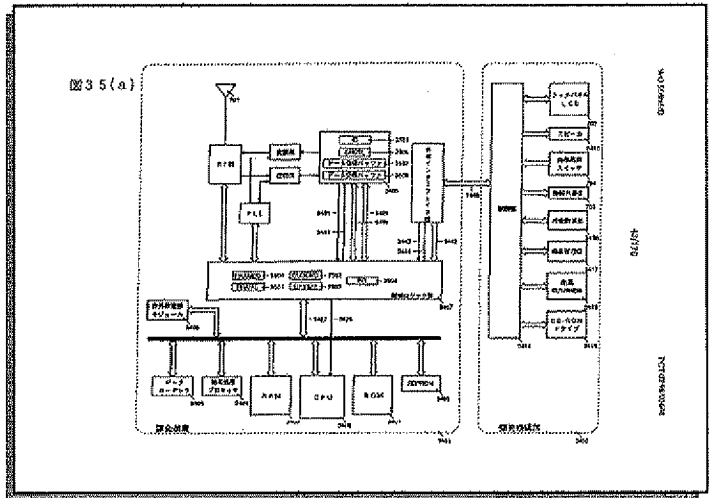


図 5 2 (a)

ユーザリスト 5200	
User List	
5200	ユーザ名
5201	User Name
5202	ユーザ ID
5203	User ID
5204	ユーザ電話番号
5205	User Telephone Number
5206	ユーザ公衆電話番号
5207	User Public Key Certificate
5208	ユーザ公開鍵証明書
5209	ユーザ公開鍵証明書 ID
5210	User Public Key Certificate ID
5211	ユーザ電話番号アドレス
5212	User Telephone Address

図 5 2 (b)

マニファストリスト 5201	
Manifest List	
5213	マニファスト ID (識別番号)
5214	Manifest ID (Identification Number)
5215	マニファスト ID (識別番号)
5216	Manifest ID (Identification Number)
5217	マニファスト ID (識別番号)
5218	Manifest ID (Identification Number)
5219	マニファスト ID (識別番号)
5220	Manifest ID (Identification Number)

図 5 2 (c)

公衆電話番号リスト 5202	
Public Telephone Number List	
5221	公衆電話番号
5222	Public Telephone Number
5223	公衆電話番号 ID
5224	Public Telephone Number ID
5225	公衆電話番号 ID (識別番号)
5226	Public Telephone Number ID (Identification Number)
5227	公衆電話番号 ID (識別番号)
5228	Public Telephone Number ID (Identification Number)

図 5 2 (d)

チケット番号リスト 5203	
Ticket Number List	
5229	チケット番号
5230	Ticket Number
5231	チケット番号 ID
5232	Ticket Number ID
5233	チケット番号 ID (識別番号)
5234	Ticket Number ID (Identification Number)
5235	チケット番号 ID (識別番号)
5236	Ticket Number ID (Identification Number)
5237	チケット番号 ID (識別番号)
5238	Ticket Number ID (Identification Number)
5239	チケット番号 ID (識別番号)
5240	Ticket Number ID (Identification Number)

図 5 2 (e)

フリーダイヤル番号リスト 5204	
Free Telephone Number List	
5241	フリーダイヤル番号
5242	Free Telephone Number
5243	フリーダイヤル番号 ID
5244	Free Telephone Number ID
5245	フリーダイヤル番号 ID (識別番号)
5246	Free Telephone Number ID (Identification Number)
5247	フリーダイヤル番号 ID (識別番号)
5248	Free Telephone Number ID (Identification Number)
5249	フリーダイヤル番号 ID (識別番号)
5250	Free Telephone Number ID (Identification Number)

図 5 2 (f)

電話番号登録リスト 5205	
Telephone Number Registration List	
5251	電話番号登録番号
5252	Telephone Number Registration Number
5253	電話番号登録番号 ID
5254	Telephone Number Registration Number ID
5255	電話番号登録番号 ID (識別番号)
5256	Telephone Number Registration Number ID (Identification Number)
5257	電話番号登録番号 ID (識別番号)
5258	Telephone Number Registration Number ID (Identification Number)
5259	電話番号登録番号 ID (識別番号)
5260	Telephone Number Registration Number ID (Identification Number)

図 5 2 (g)

サービス提供番号リスト 5206	
Service Provision Number List	
5261	サービス提供番号
5262	Service Provision Number
5263	サービス提供番号 ID
5264	Service Provision Number ID
5265	サービス提供番号 ID (識別番号)
5266	Service Provision Number ID (Identification Number)
5267	サービス提供番号 ID (識別番号)
5268	Service Provision Number ID (Identification Number)

図 4 9

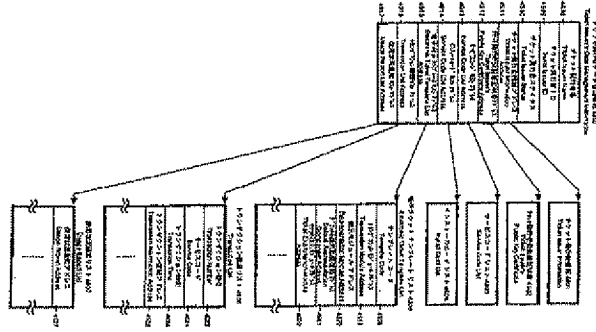


図 5 3

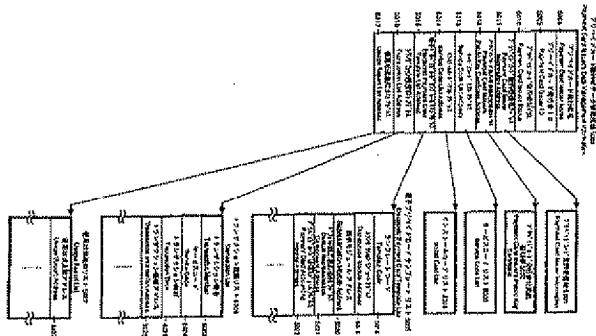
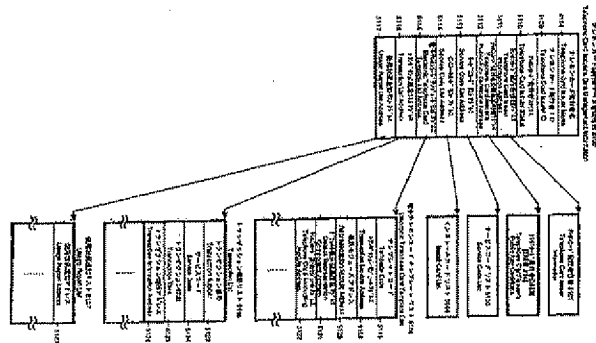
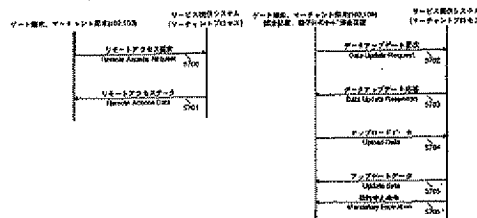
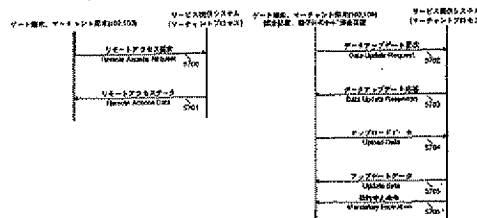
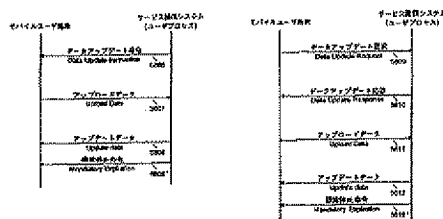
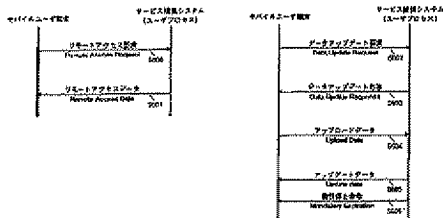
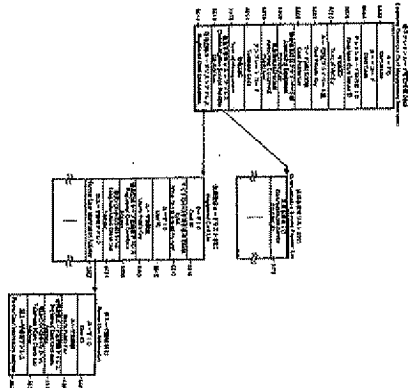
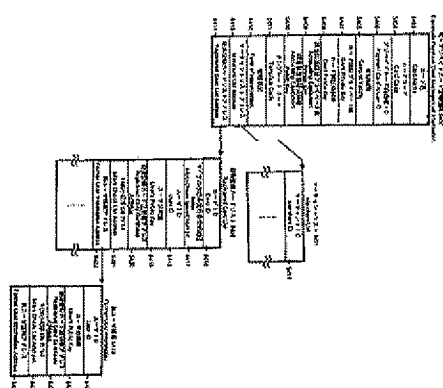
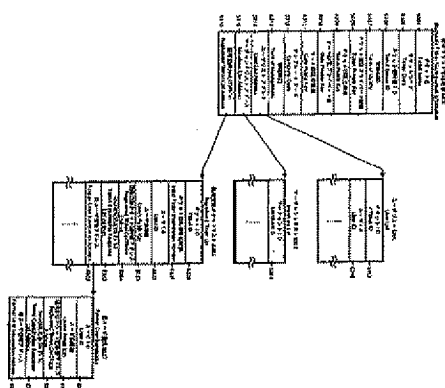
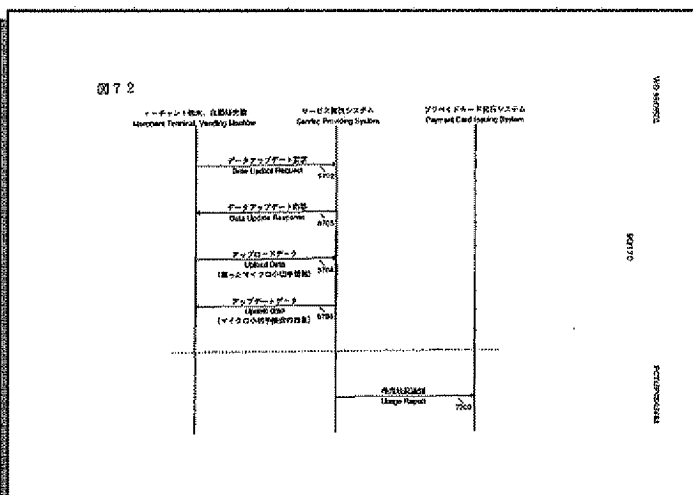
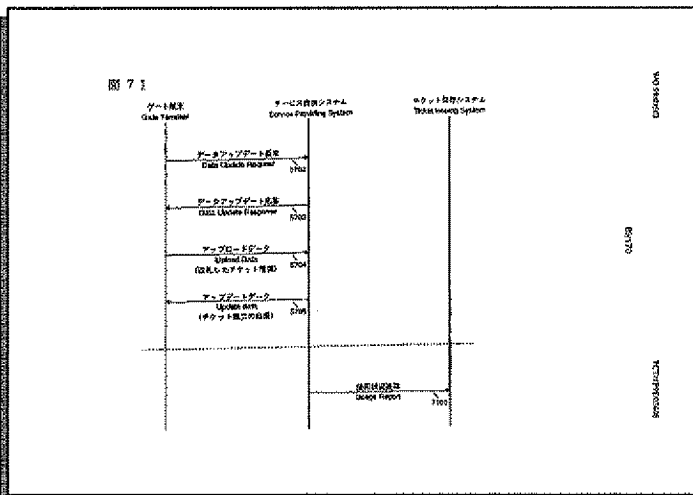
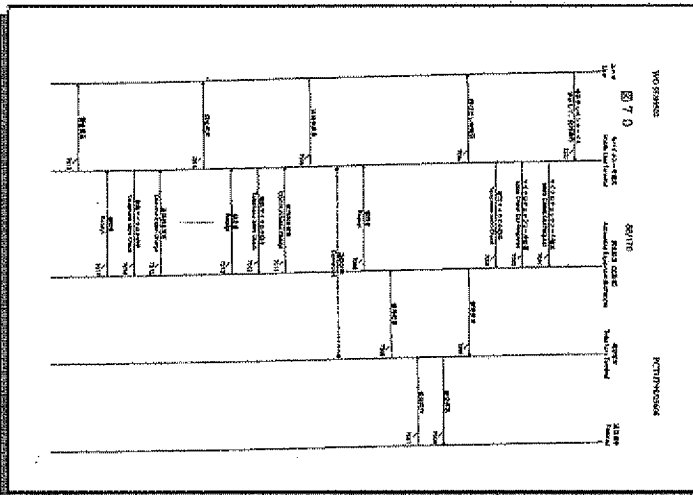
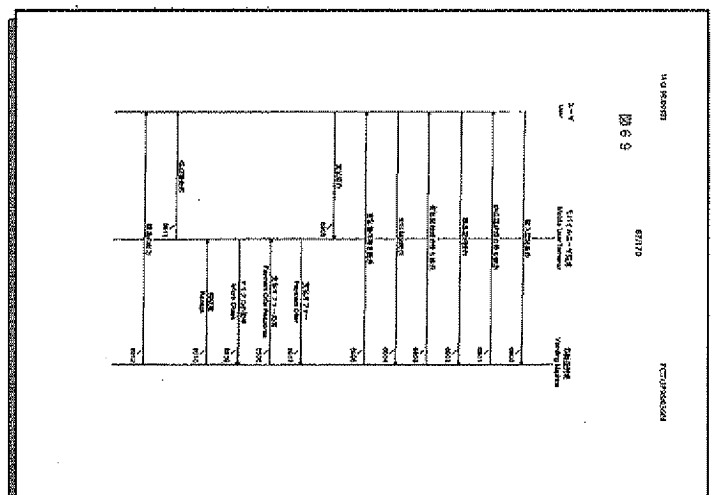
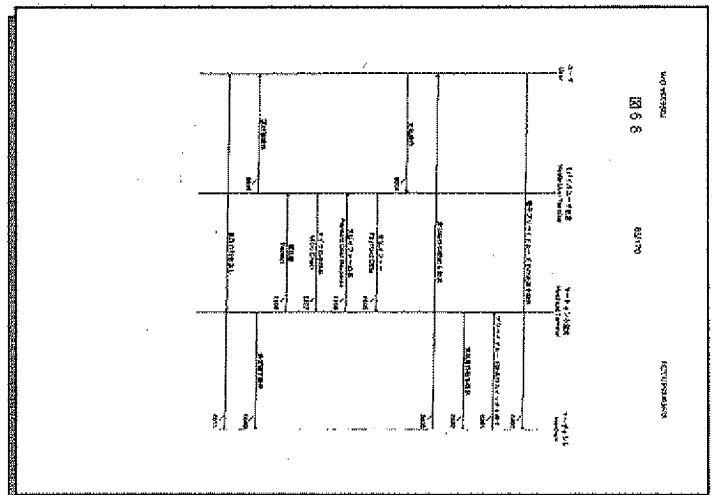
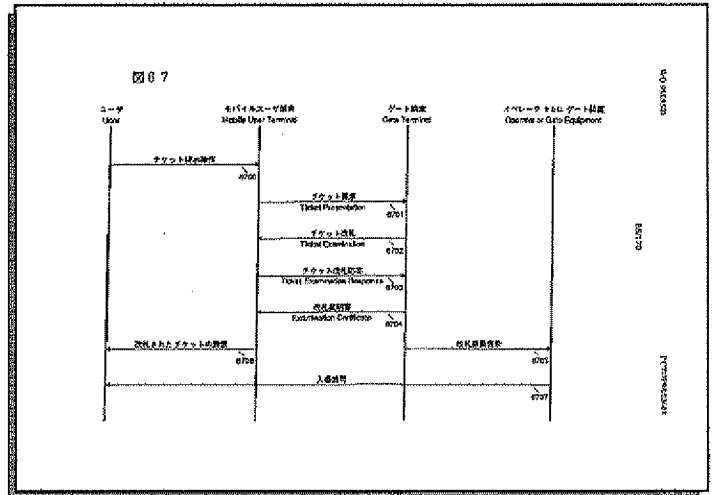
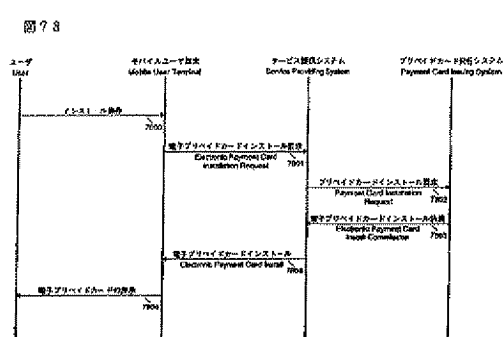
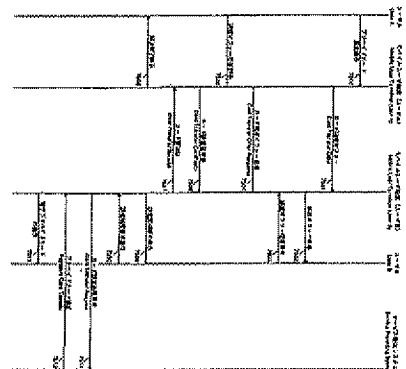
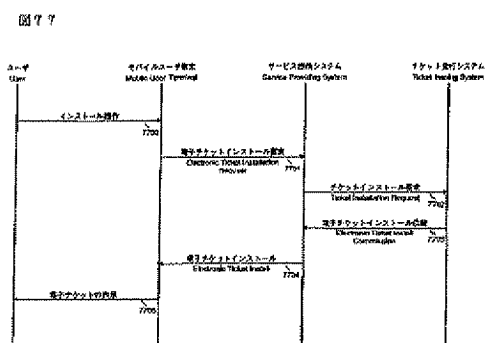
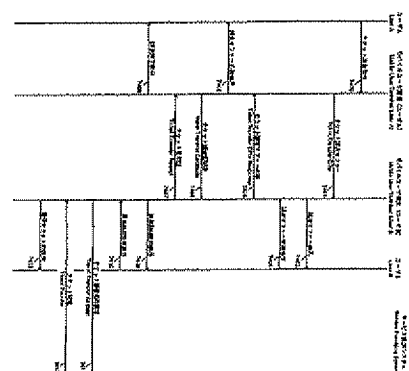
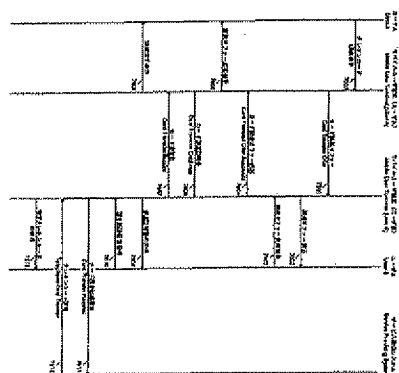
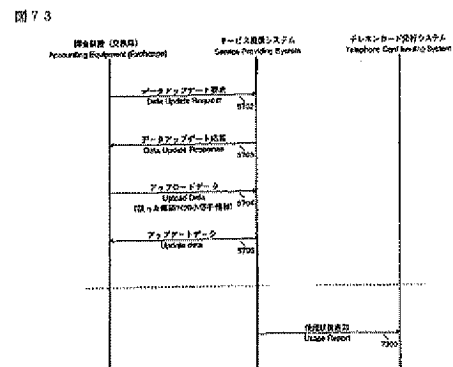


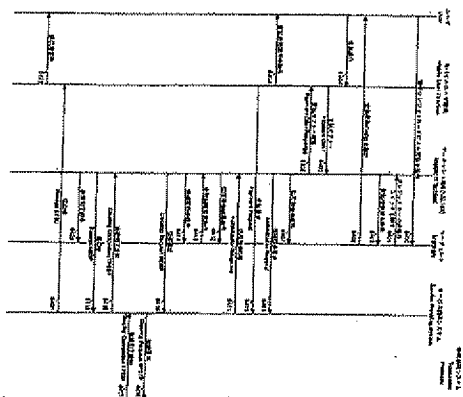
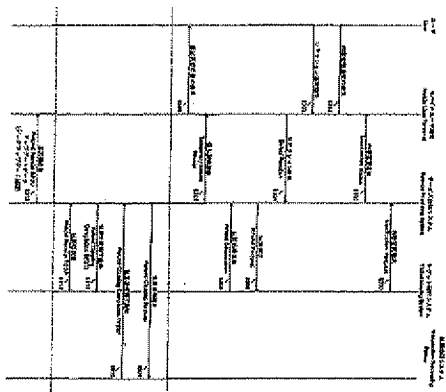
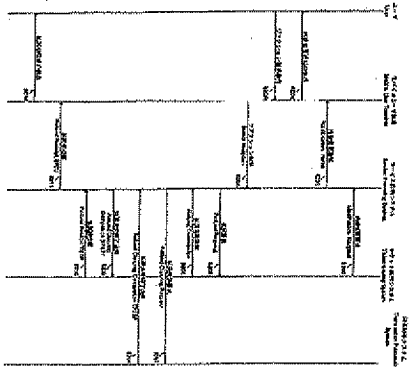
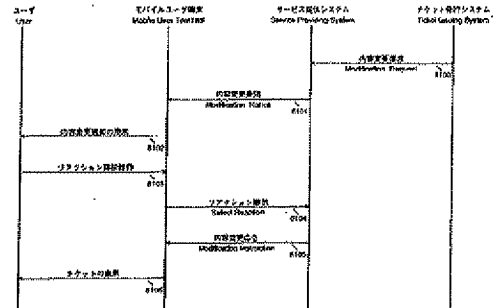
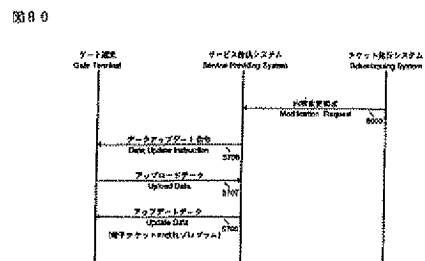
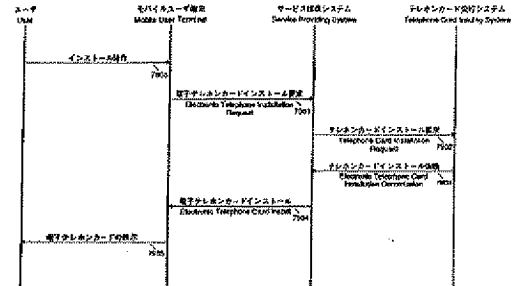
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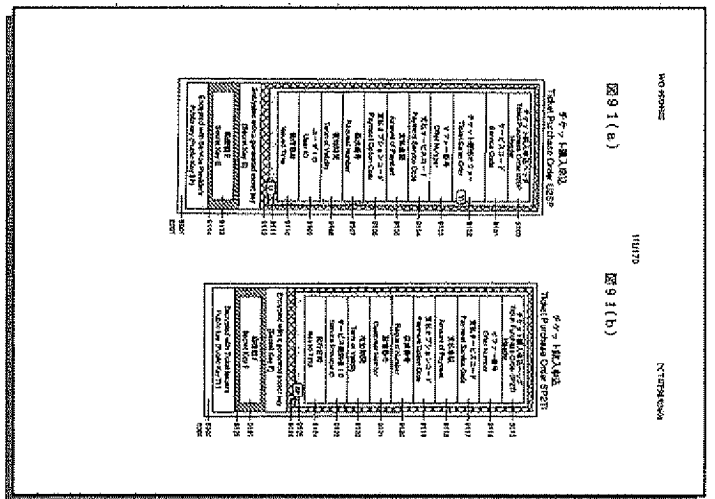
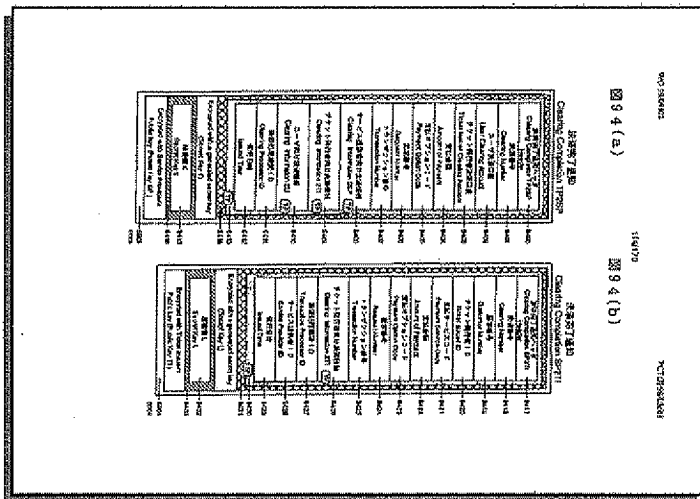
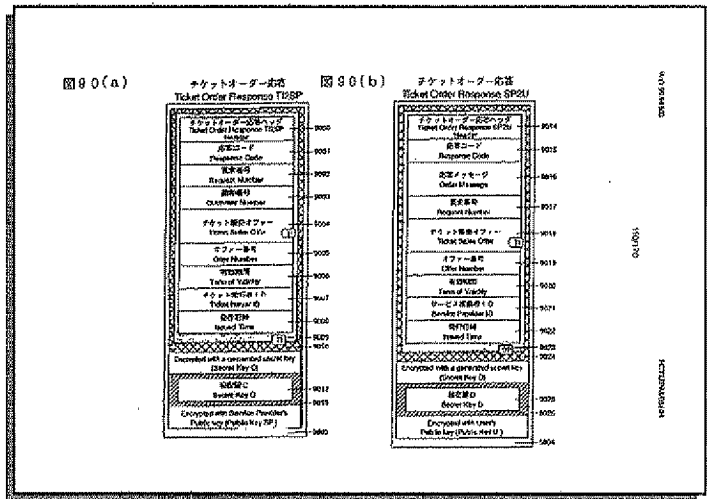
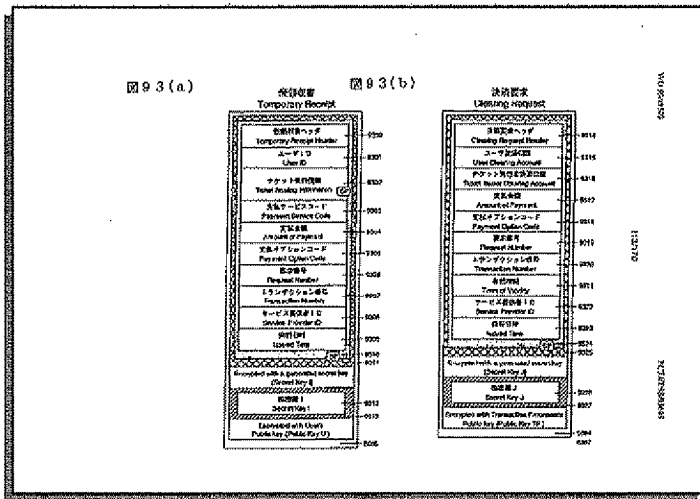
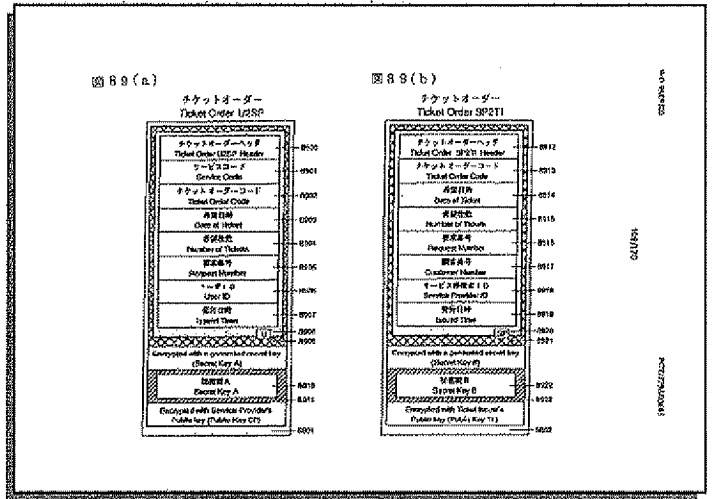
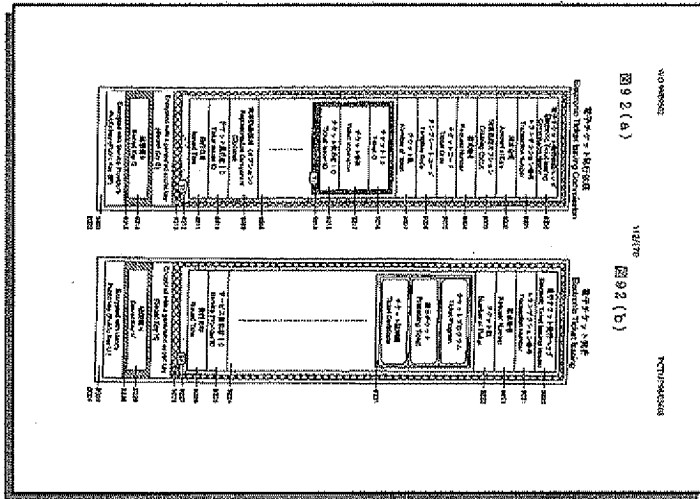


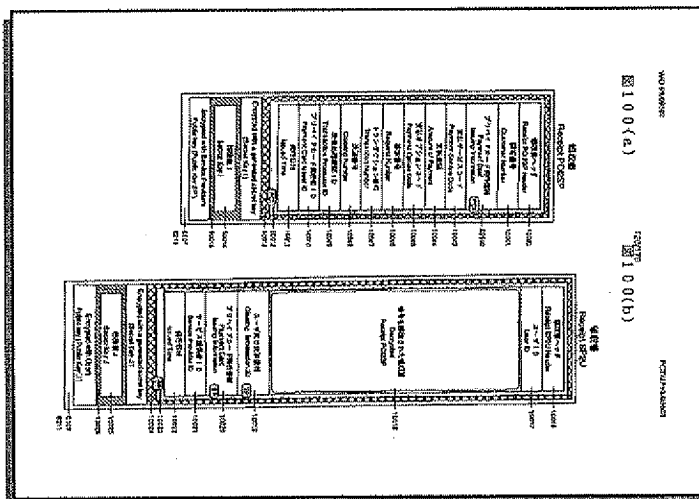
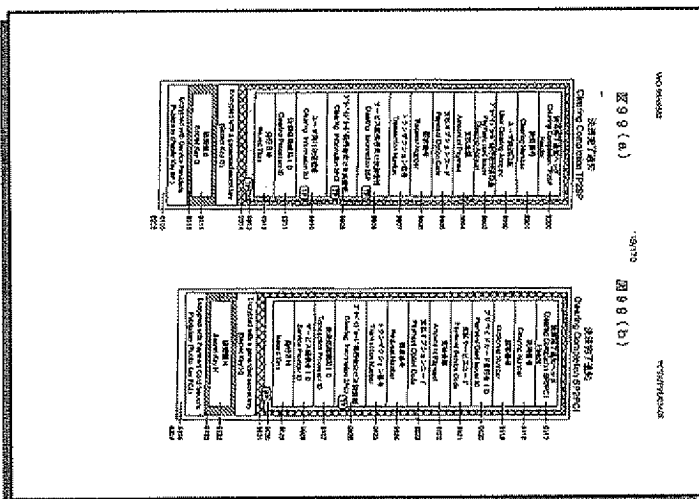
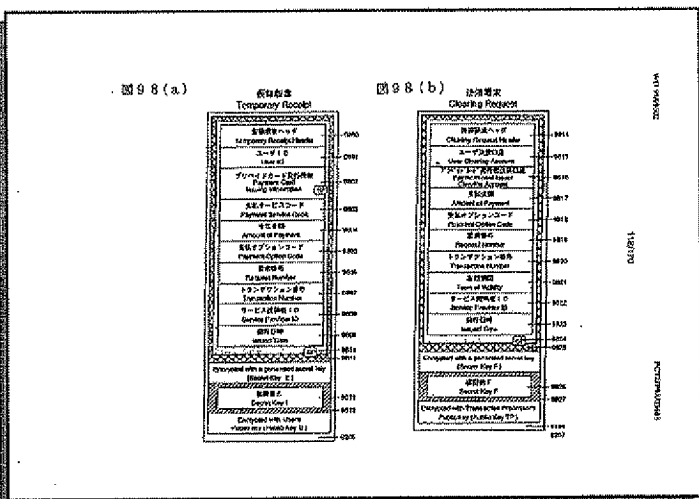
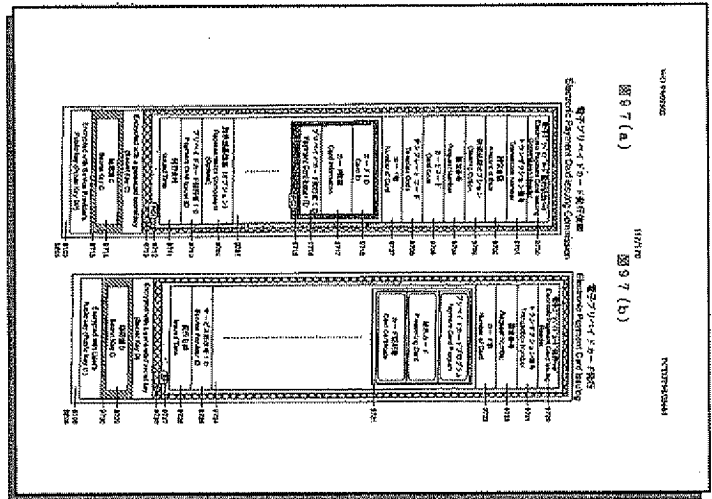
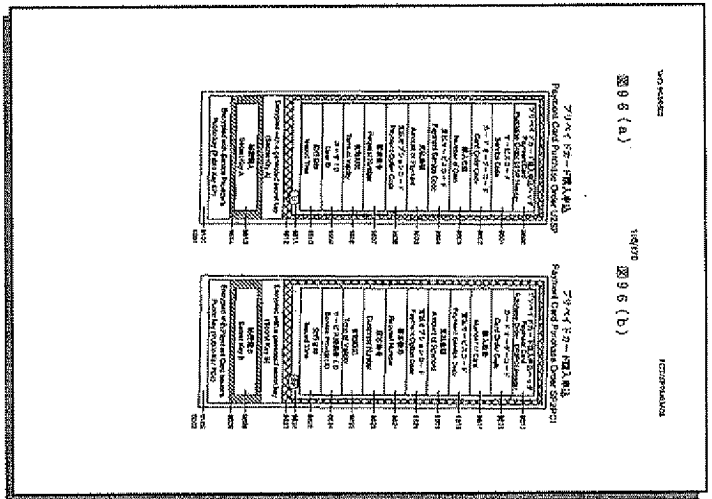
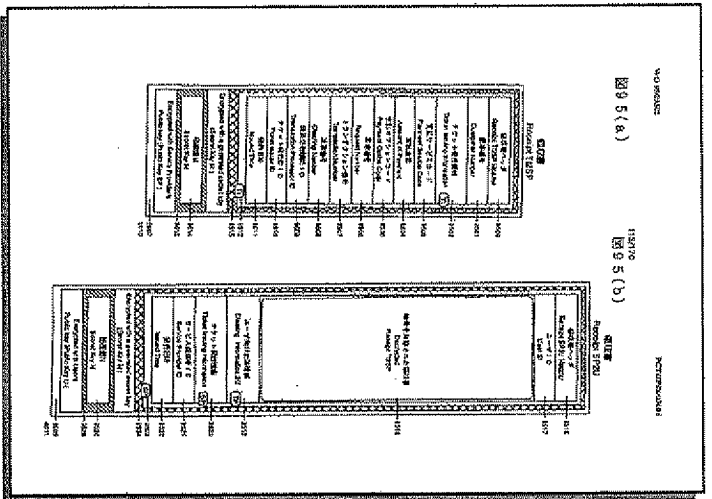












$\mathbb{R}^{101(A)}$

32312.

101(h)

[illegible]

图 10-2-12 (续)

520570

Figure 2 (b)

[illegible]

1036

1225170

1997

[illegible] $\mathbb{R}^{104(a)}$

02492.

图 104

[illegible]

图 105 (a)

4054175

$\mathbb{Q}105(b)$

[illegible]

圖 106 (b)

チケット2000番発行
Ticket Contribution to Society

— 100 —

100-bit	100-bit
100-bit	100-bit
100-bit	100-bit
100-bit	100-bit
100-bit	100-bit

700-bit	700-bit
700-bit	700-bit
700-bit	700-bit
700-bit	700-bit
700-bit	700-bit

200-bit	200-bit
200-bit	200-bit
200-bit	200-bit
200-bit	200-bit
200-bit	200-bit

106 (a)

Ticket Useage
Ticket Reservation[illegible]

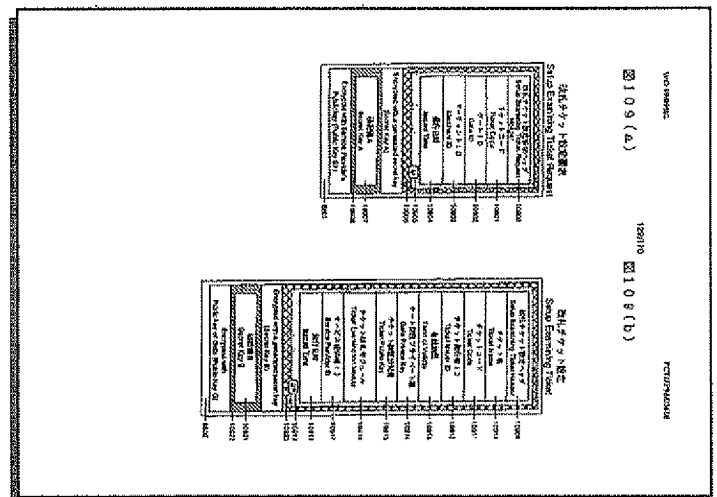
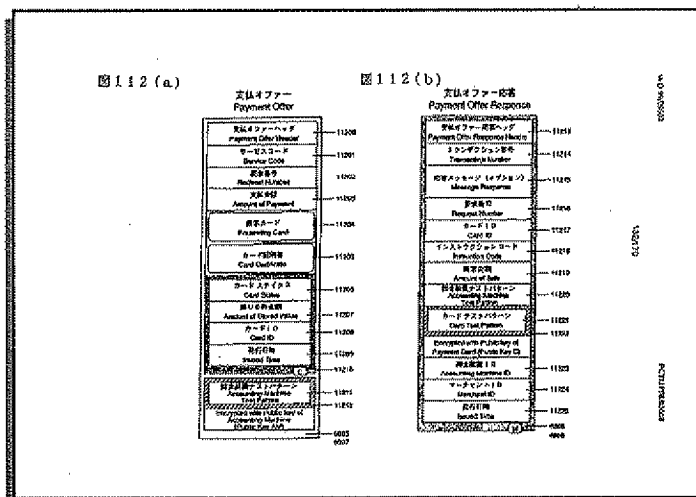
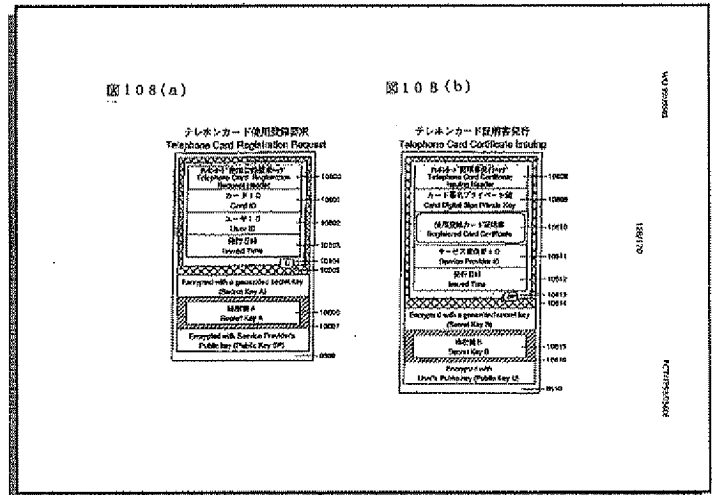
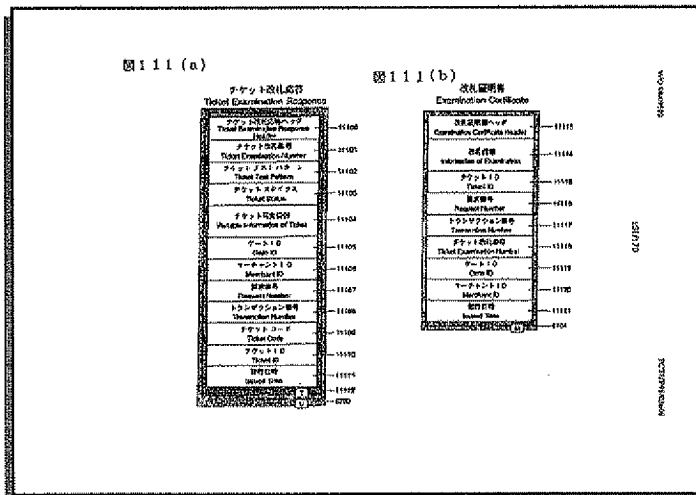
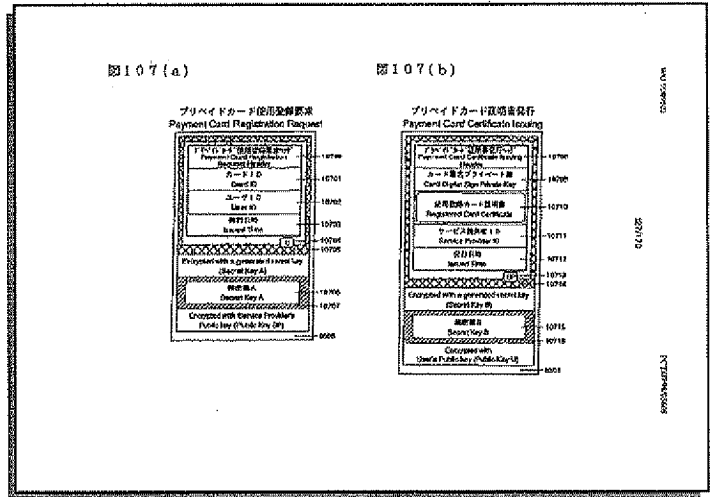
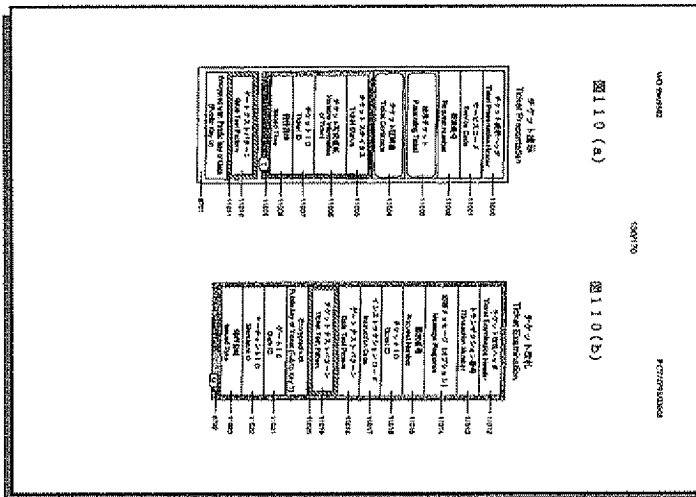


PLATE 1

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UN POC
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10786244

7077984046

125170

~~§ 1.17~~ (a)

(q) 4.11

[illegible]

☒ 118(a)

§ 118(b)

Figure 1: Main Shrine and Shrine of the Gods

Top Plan: Main Shrine (Honden)

Overall dimensions: 11.50m (37' 9") x 11.50m (37' 9")

Internal dimensions: 10.50m (34' 6") x 10.50m (34' 6")

Building dimensions: 10.50m (34' 6") x 10.50m (34' 6")

Building area: 110.25 m² (1200 sq ft)

Building volume: 110.25 m³ (3900 cu ft)

Building weight: 110.25 t (243,000 lb)

Building height: 10.50m (34' 6")

Building depth: 10.50m (34' 6")

Building width: 10.50m (34' 6")

Building length: 10.50m (34' 6")

Building area: 110.25 m² (1200 sq ft)

Building volume: 110.25 m³ (3900 cu ft)

Building weight: 110.25 t (243,000 lb)

Building height: 10.50m (34' 6")

Building depth: 10.50m (34' 6")

Building width: 10.50m (34' 6")

Building length: 10.50m (34' 6")

Bottom Plan: Shrine of the Gods (Miyasato)

Overall dimensions: 11.50m (37' 9") x 11.50m (37' 9")

Internal dimensions: 10.50m (34' 6") x 10.50m (34' 6")

Building dimensions: 10.50m (34' 6") x 10.50m (34' 6")

Building area: 110.25 m² (1200 sq ft)

Building volume: 110.25 m³ (3900 cu ft)

Building weight: 110.25 t (243,000 lb)

Building height: 10.50m (34' 6")

Building depth: 10.50m (34' 6")

Building width: 10.50m (34' 6")

Building length: 10.50m (34' 6")

Building area: 110.25 m² (1200 sq ft)

Building volume: 110.25 m³ (3900 cu ft)

Building weight: 110.25 t (243,000 lb)

Building height: 10.50m (34' 6")

Building depth: 10.50m (34' 6")

Building width: 10.50m (34' 6")

Building length: 10.50m (34' 6")

§ 118(e)

(c) 61124

Figure 1 shows two views of a document assembly. The top view is a front elevation, and the bottom view is a side elevation. Both views show a large rectangular frame with a central blank area. The top view includes labels for 'Top of Document', 'Bottom of Document', 'Left of Document', 'Right of Document', 'Top of Page', 'Bottom of Page', 'Left of Page', 'Right of Page', 'Top of Section', 'Bottom of Section', 'Left of Section', 'Right of Section', 'Top of Table', 'Bottom of Table', 'Left of Table', 'Right of Table', 'Top of Figure', 'Bottom of Figure', 'Left of Figure', 'Right of Figure'. The bottom view includes labels for 'Top of Document', 'Bottom of Document', 'Left of Document', 'Right of Document', 'Top of Page', 'Bottom of Page', 'Left of Page', 'Right of Page', 'Top of Section', 'Bottom of Section', 'Left of Section', 'Right of Section', 'Top of Table', 'Bottom of Table', 'Left of Table', 'Right of Table', 'Top of Figure', 'Bottom of Figure', 'Left of Figure', 'Right of Figure'. Dimensions are indicated by arrows and numbers.

圖 120 (a)

圖 120 (b)

[illegible] $\mathbb{R}^{1,2}(\mathbb{R})$

121(b)

107 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 107-10000		108 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 108-10000	109 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 109-10000	110 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 110-10000	111 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 111-10000	112 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 112-10000	113 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 113-10000	114 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 114-10000	115 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 115-10000	116 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 116-10000	117 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 117-10000	118 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 118-10000	119 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 119-10000	120 日本郵船株式會社 Nippon Yusen Kaisha, Ltd. 120-10000
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图 122(a)

$\mathbb{R}^{12B(a)}$

128(b)

[illegible]

Figure 128(a)

129(h)

1525	1526	1527	1528	1529	1530	1531	1532	1533	1534	1535	1536	1537	1538	1539	1540	1541	1542	1543	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1557	1558	1559	1560	1561	1562	1563	1564	1565	1566	1567	1568	1569	1570	1571	1572	1573	1574	1575	1576	1577	1578	1579	1580	1581	1582	1583	1584	1585	1586	1587	1588	1589	1590	1591	1592	1593	1594	1595	1596	1597	1598	1599	1600	1601	1602	1603	1604	1605	1606	1607	1608	1609	1610	1611	1612	1613	1614	1615	1616	1617	1618	1619	1620	1621	1622	1623	1624	1625	1626	1627	1628	1629	1630	1631	1632	1633	1634	1635	1636	1637	1638	1639	1640	1641	1642	1643	1644	1645	1646	1647	1648	1649	1650	1651	1652	1653	1654	1655	1656	1657	1658	1659	1660	1661	1662	1663	1664	1665	1666	1667	1668	1669	1670	1671	1672	1673	1674	1675	1676	1677	1678	1679	1680	1681	1682	1683	1684	1685	1686	1687	1688	1689	1690	1691	1692	1693	1694	1695	1696	1697	1698	1699	1700	1701	1702	1703	1704	1705	1706	1707	1708	1709	1710	1711	1712	1713	1714	1715	1716	1717	1718	1719	1720	1721	1722	1723	1724	1725	1726	1727	1728	1729	1730	1731	1732	1733	1734	1735	1736	1737	1738	1739	1740	1741	1742	1743	1744	1745	1746	1747	1748	1749	1750	1751	1752	1753	1754	1755	1756	1757	1758	1759	1760	1761	1762	1763	1764	1765	1766	1767	1768	1769	1770	1771	1772	1773	1774	1775	1776	1777	1778	1779	1780	1781	1782	1783	1784	1785	1786	1787	1788	1789	1790	1791	1792	1793	1794	1795	1796	1797	1798	1799	1800	1801	1802	1803	1804	1805	1806	1807	1808	1809	1810	1811	1812	1813	1814	1815	1816	1817	1818	1819	1820	1821	1822	1823	1824	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	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 $\mathbb{Z}_{130}(a)$

130(b)

[illegible]

3 (b)

图 13-1(a)

[illegible]

132 (a)

~~§ 132(b)~~

[illegible]

图 133(a)

133(b)

[illegible]

図140

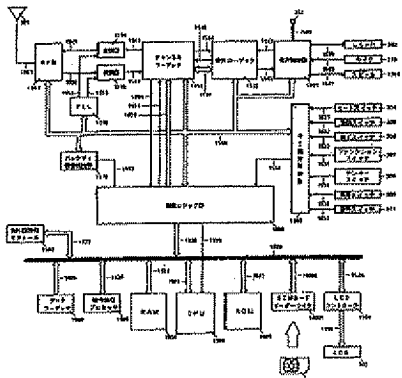


図138(a)

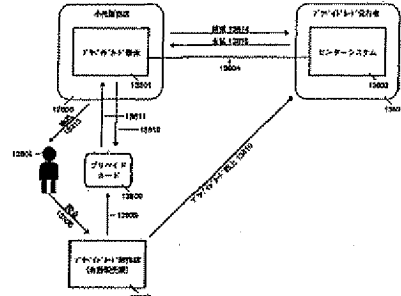


図138(b)

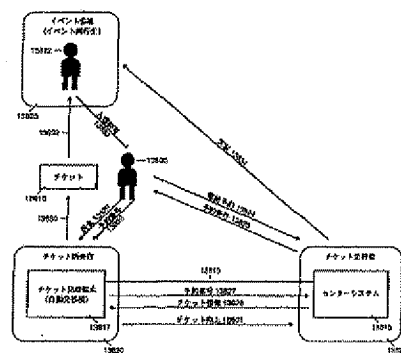


図139(a)

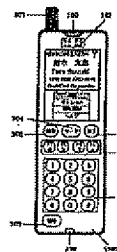


図139(b)

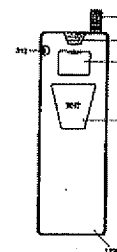


図141(a)

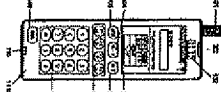


図141(b)

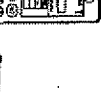


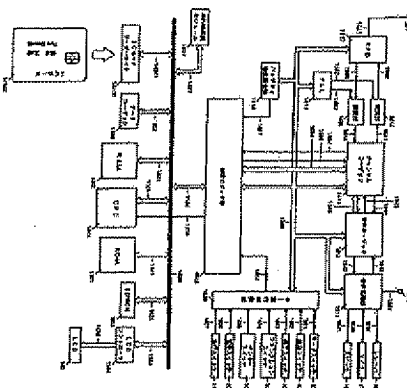
図141(c)



図141(d)



図142



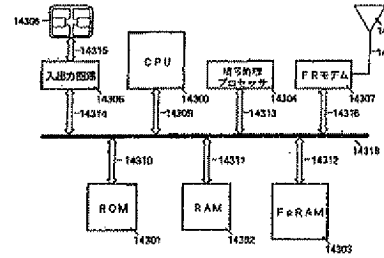


FIG. 14.3

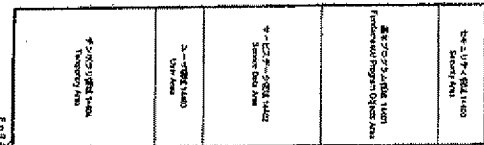


FIG. 14.4